

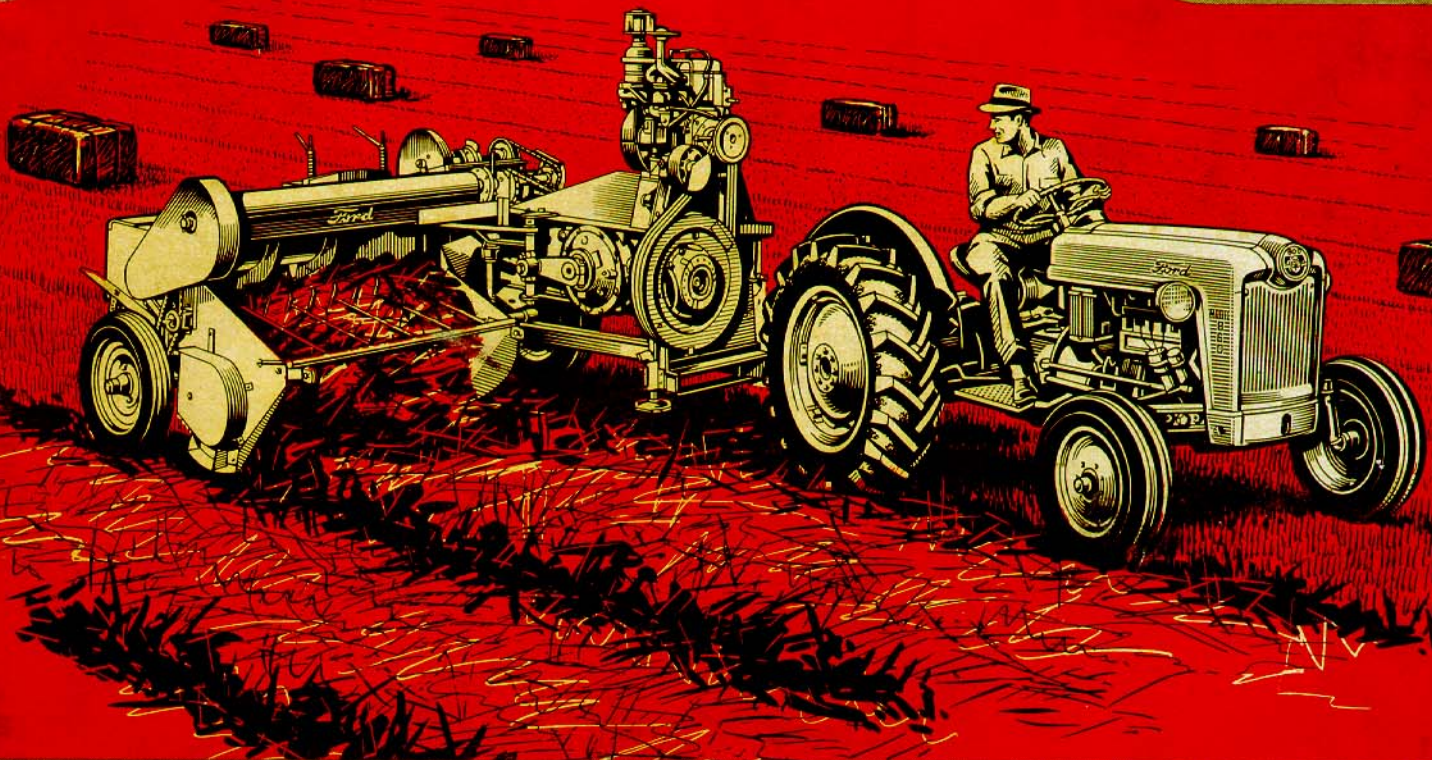
WAYNE TRACTOR & EQUIP. CO.
HONESDALE, PA.

FORD

HAY BALER

SERIES 250

OWNER'S MANUAL



Prepared by
TRACTOR AND IMPLEMENT DIVISION
FORD MOTOR COMPANY

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FORD HAY BALER

SERIES 250

OWNER'S MANUAL

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Prepared by
**TRACTOR AND IMPLEMENT DIVISION
FORD MOTOR COMPANY**
Birmingham, Michigan

OPERATION

Your Ford Hay Baler is a field-proven machine which should provide you with fast and dependable baling.

Hay is carried by the pick-up and auger into the baling chamber where it is twine tied into bales 36 or 42 inches in length. The bales are then pushed, under compression, out of the chamber.

Like all equipment of this type, efficient performance depends upon proper adjustment, maintenance and operation. The operator, therefore, must become thoroughly familiar with the function of the various units of the machine and must know how to control and adjust them so that desired results are obtained.

This section of the manual on OPERATION presents information on haying conditions and on the function and operation of the baler. Remember that proper operation of the baler means efficient performance and greater profits. Remember too, that proper adjustments are important in obtaining satisfactory operation of the baler.

GENERAL HAYING INFORMATION

The proper time to start making hay is a matter requiring careful consideration. A year's hay crop can either be made or lost in a few days, and the difference depends largely upon the timing of various haying operations and the manner in which they are performed. The proper time to start mowing hay may vary with local weather conditions and the particular type of crop which is to be baled.

Raking is also an important factor in harvesting and conserving a hay crop. Unless care is exercised in raking, many of the nutrient rich leaves will be lost. Raking should be done in the same direction in which the hay was mowed. This procedure will turn a greater portion of the leaves toward the center of the windrow and leave the stems exposed for faster drying. It is also important that raking be done when the moisture content of the mowed crop has been reduced to about 40% or when the crop is thoroughly wilted. If the hay is too dry, leaves may be lost in the process of raking.

It is especially important that the entire swath be raked and the hay be laid over the stubble. This will provide better curing and will enable the baler to do a thorough job of picking the hay from the windrow.

To facilitate baling operation, the windrows should be reasonably straight and as uniform in size as possible. Medium sized windrows can be handled most advantageously.

When a sample of hay taken from the center of a windrow and twisted between the hands shows no sign of moisture, the hay is generally sufficiently cured for baling.

Before starting into the field, the operator should first be certain that the hay is fully cured, the baler is operating efficiently and that initial adjustments necessary for baling have been made.

NOTE: It is recommended that the baler be operated in the same direction in which the hay was raked.

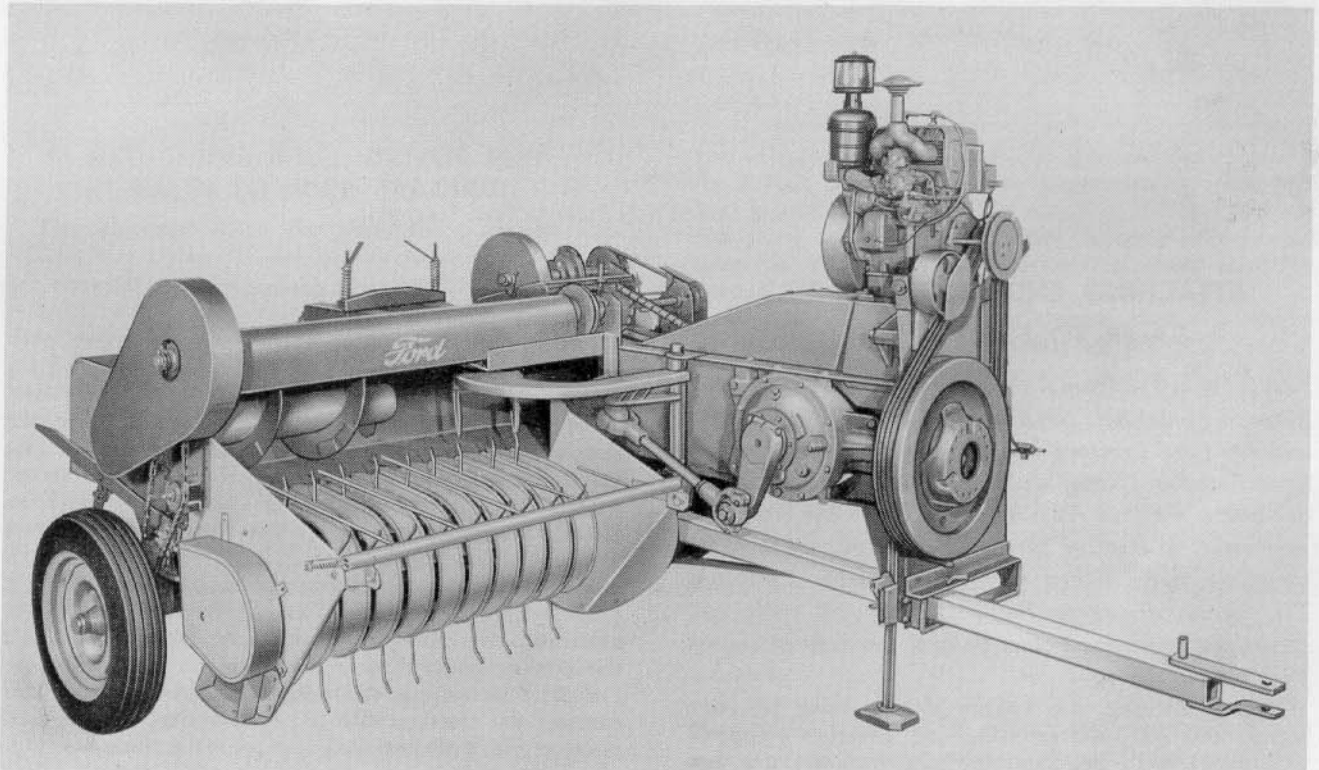


Figure 1

Series 250 Hay Baler (Engine Driven)

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OPERATION

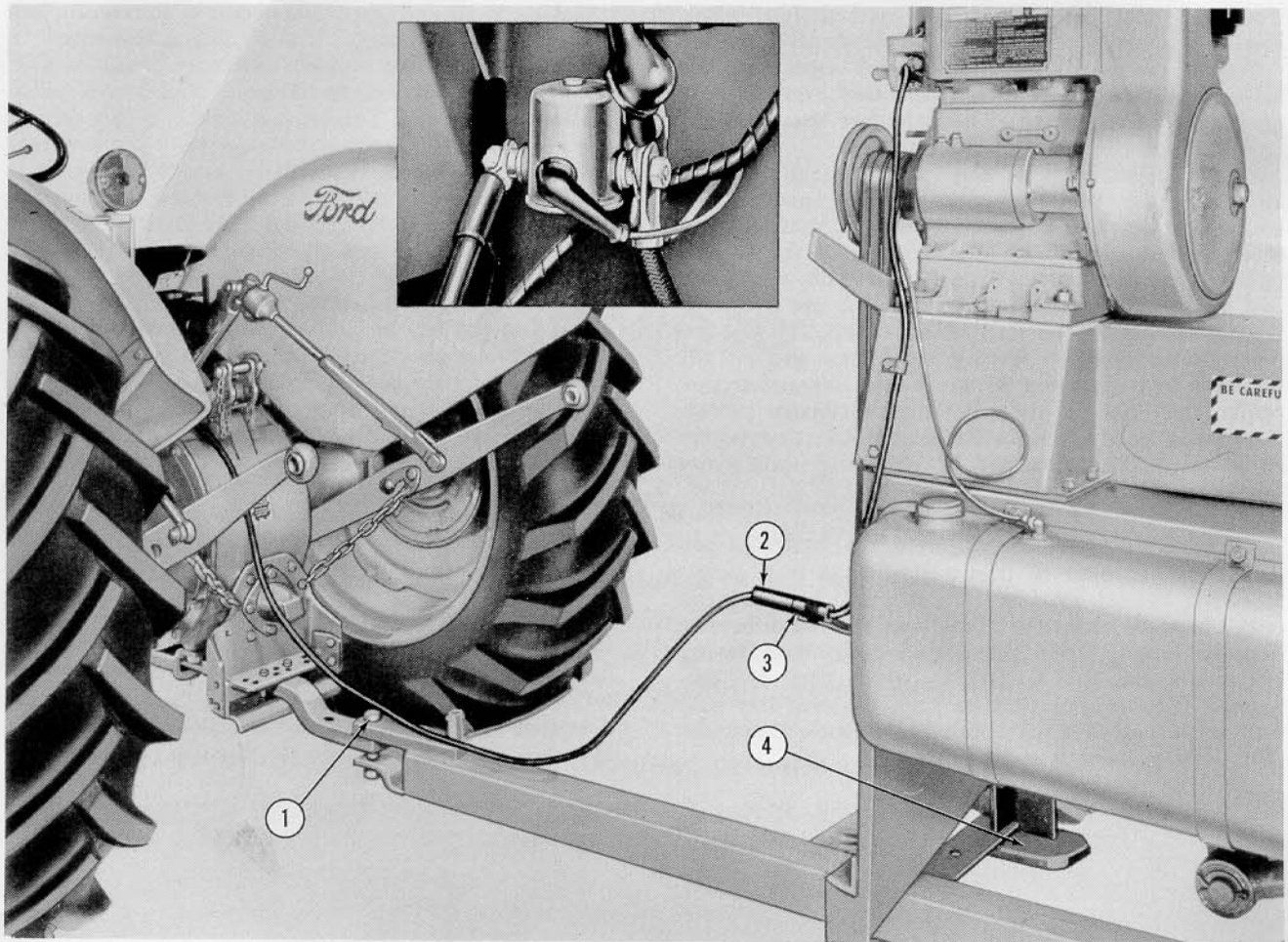


Figure 2

Attaching Engine Driven Hay Baler to Ford Tractor

ATTACHING ENGINE DRIVEN HAY BALER TO FORD TRACTOR

NOTE: When hitching the engine driven Ford Hay Baler to Model 8N, NAA or early Series 600, 700, 800 and 900 Ford Tractors, it is advisable to use a Drawbar Extension Kit (Part No. 230904) or Swinging Drawbar which are sold separately. Failure to use either kit may result in damage to the baler tongue when short turns are made. When using the Drawbar Extension Kit, always disengage the power take-off lever and secure the hydraulic Touch Control Lever in its lowest position on the quadrant.

When hitching the engine driven baler to later Series 600, 700, 800 or 900 Ford Tractors equipped (standard) with the swinging drawbar, the drawbar should be adjusted to its shortest position with the offset down as shown in Figure 2. On electric starter units, paint should be removed from the drawbar to

provide a good electrical ground contact between the baler and tractor.

Position the baler tongue in the extreme left position for field operation, and in the right position for transport purposes.

To attach the hay baler to the tractor, raise the tongue to the proper height by means of the jack (4), Figure 2. Back the tractor up to the hitch and secure with a lock pin or bolt and nut (1). If the baler is an electric starter unit, connect the starter cable (2) to the connector (3) on the baler and to the tractor starter solenoid as shown in the insert. Raise the jack to the transport position as shown and secure by installing the hair pin through the jack stand above the ratchet mechanism.

Before detaching the baler from the tractor, disconnect the starter cable (2), lower the jack (4) and remove the drawbar lock pin or bolt and nut (1).

NOTE: To disconnect the cable (2), it will be necessary to push in on the connecting sleeve, and then pull out.

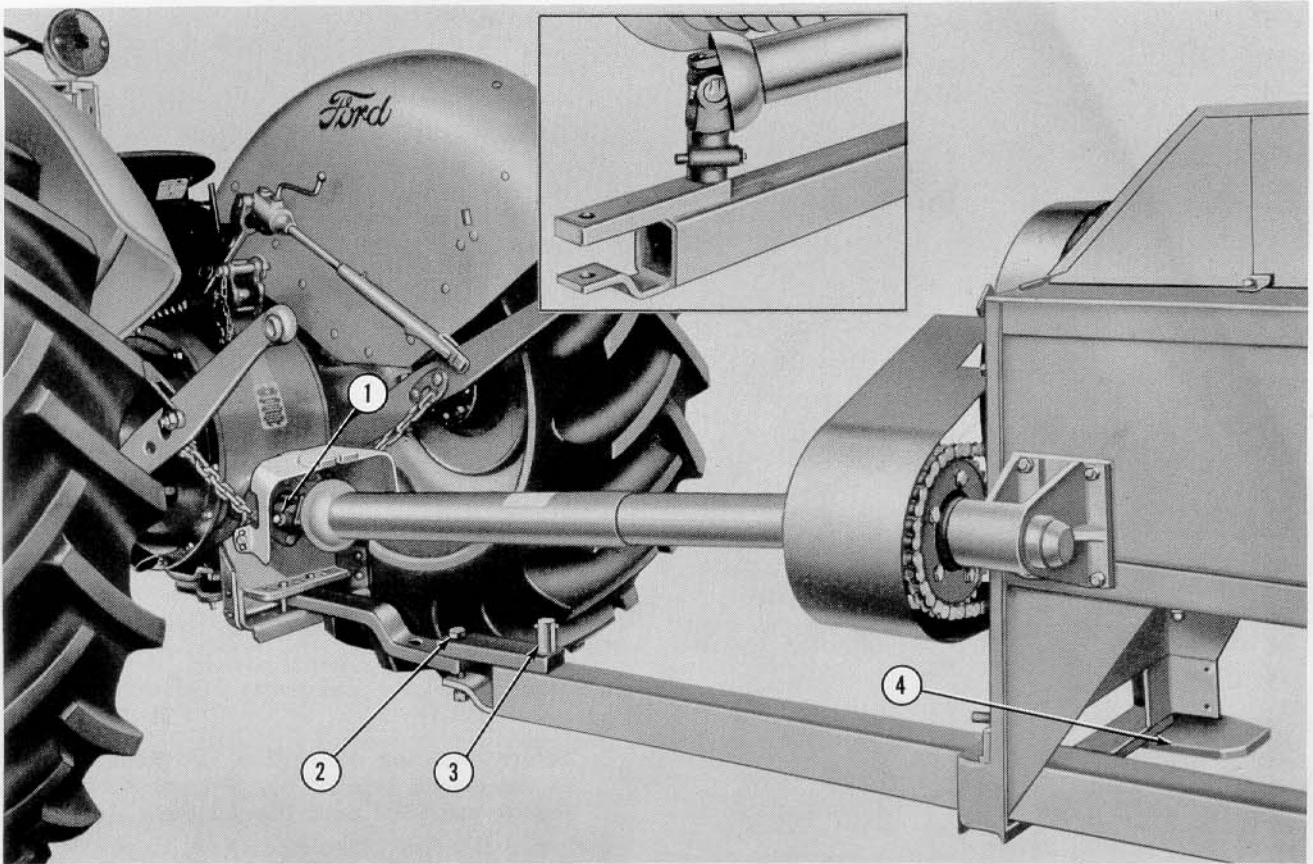


Figure 3
Attaching P.T.O. Driven Baler to Ford Tractor

ATTACHING P.T.O. DRIVEN HAY BALER TO FORD TRACTOR

The universal drive shaft and hitch on the Ford P.T.O. Hay Baler (Model 14-80) are designed for use on tractors having a P.T.O. and drawbar which meets A.S.A.E. standards. Tractors on which the location of the P.T.O. and drawbar differ from A.S.A.E. standards must be adapted for use with the Ford P.T.O. Hay Baler by installing a special P.T.O. conversion unit.

NOTE: A Ford Tractor P.T.O. Conversion Kit (Part No. 230905) or a Swinging Drawbar and Splined P.T.O. Shaft Adapter are available as extra equipment for converting Model 8N, NAA and early Series 600, 700, 800 and 900 Ford Tractors to A.S.A.E. standards.

When attaching the baler to late Series 600, 700, 800 and 900 Ford Tractors which are equipped (standard) with a Swinging Drawbar and $1\frac{3}{8}$ " P.T.O. shaft, the drawbar should be in the extended position with the offset down as shown in Figure 3. The drawbar should be locked in the center position with two $\frac{5}{16}$ " bolts. The baler tongue may be set in the extreme left position for field operation or in the right position for transport purposes.

CAUTION: Do not attach the universal drive shaft to the tractor when the baler is to be transported. A

special retainer (3), Figure 3, is provided for attaching the P.T.O. shaft to the baler tongue during transport (see insert, Figure 3). When changing the tongue from transport to operating position, always remove the universal drive from the retainer and attach it to the tractor P.T.O. shaft.

To attach the baler to the tractor, raise the tongue to the proper height by means of the jack (see 4, Figure 3). Next, disengage the tractor P.T.O. and back the tractor into position in front of the baler. Attach the tongue to the drawbar with a lock pin and bolt and nut (2) as shown.

Place a few drops of oil on the tractor P.T.O. shaft and turn the shaft until the hole is aligned with the hole in the universal joint assembly. Push in on the spring-loaded pin (1), Figure 3, and slide the universal joint over the P.T.O. shaft until the pin is locked.

CAUTION: Do not pound on the universal joint with a hammer.

If the tractor P.T.O. shaft is not grooved to accommodate the snap pin (1), secure the joint by inserting a $\frac{5}{16}$ " x $2\frac{1}{2}$ " machine bolt through the shaft and installing a lockwasher and nut.

Refer to the section on FINAL BALING PREPARATIONS, page 6.

OPERATION

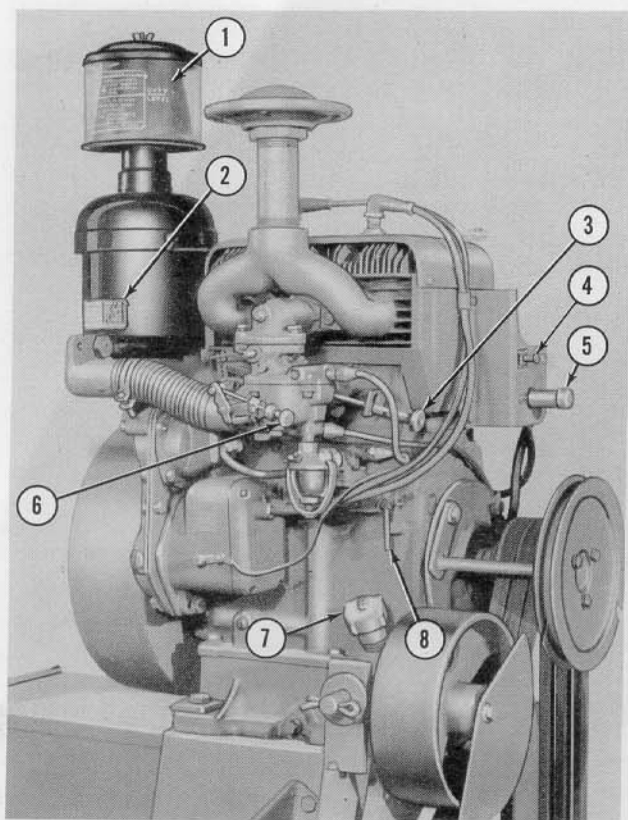


Figure 4

Baler Engine—Right Front View

OPERATING THE ENGINE

Starting: The Wisconsin TF-D air cooled engine on Model 14-71 balers is equipped with an impulse magneto and may be started with a pull rope or with an electric starter powered by the tractor battery. To start the engine, proceed as follows:

1. Disengage the idler pulley by setting the pulley lever in the disengaged position.
2. Turn the baler flywheel counter-clockwise (facing flywheel) by hand to make sure that the plunger operates freely and without obstruction.
3. Fill the engine crankcase with oil (see 7, Figure 4) and the fuel tank with gasoline according to the instructions provided in the engine manual.
4. Pump the hand primer lever (8), Figure 4, ten to twenty strokes. This may not be necessary when the engine is warm.

NOTE: When there is no noticeable resistance to the primer lever, it will be necessary to turn the engine over a revolution until a pumping action is noticeable.

5. Pull out the engine stop button (4) and the choke (6), Figure 4, then start the engine with

the starter (5), or with the pull rope wrapped counter-clockwise on the sheave. When the engine is started, close the choke lever gradually as the engine warms up.

6. Set the throttle lever (3), Figure 4, to maintain a speed of not more than 68 strokes per minute on the baler plunger. The nuts on the throttle lever may be adjusted to provide the desired idle setting and full throttle setting.

Stopping: To stop the engine, proceed as follows:

1. Reduce the throttle to the idling position and allow the engine to idle for approximately three minutes.
2. Push the stop button (4), Figure 4, in.

FINAL BALING PREPARATIONS

When the baler has been thoroughly checked and lubricated as directed on Page 22, the operator should perform the following steps immediately before starting to bale.

1. Start the engine and engage the drive belt or tractor P.T.O.
2. Before threading the needles, use paint remover or run several bales of hay through the baler to remove paint and clean the chamber.
3. When the baling chamber is reasonably smooth and free of paint, disengage the drive belt or tractor P.T.O. and stop the engine.

THREADING NEEDLES

1. Place four balls of twine, proper end up, in the twine can. Tie the inside ends of the reserve balls to the outside ends of the feed balls as shown at (6) and (7), Figure 5.
2. Thread the inside ends of the feed balls through the guides (1) and (2), Figure 5, on the twine can cover, through the holes (3) in the left side of the can and down through the twine tension assembly (4) and guides (5). Next, run the twine through the axle support bracket guide (3), Figure 6, and then through the guides (2), and the needle eyes.
3. Tie the twine ends to the needle yoke as shown at (1), Figure 6.
4. Turn the metering wheel (1), Figure 16, until the knotter mechanism is tripped.
5. Start the baler engine and engage the drive belts or tractor P.T.O.
6. Stop the baler and untie the twine from the needle yoke (1), Figure 6. Pull the loose end of the twine from the knotter assembly and discard.

OPERATION

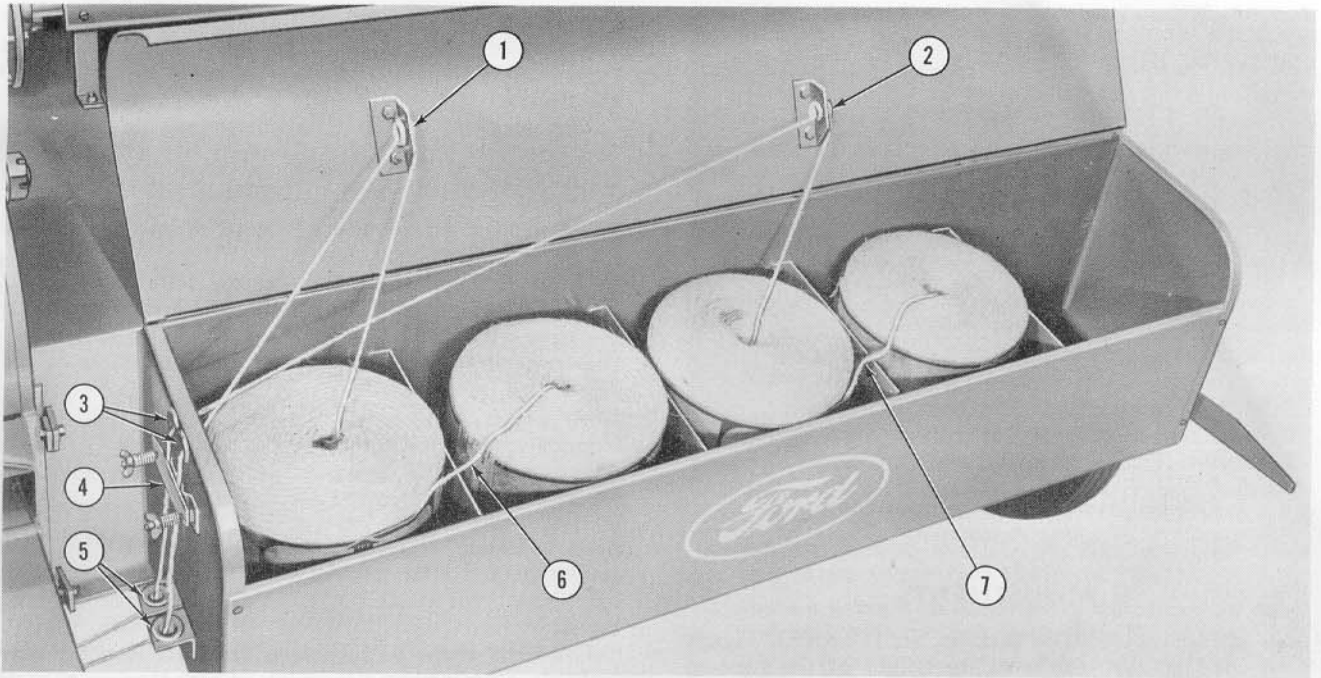


Figure 5
Placing Twine in Twine Can

STARTING TO BALE

1. Lower the pick-up assembly and secure the lever in the next to the last hole for average operating conditions. See (8), Figure 7.
2. Operate the baler at a moderate speed in medium windrows until a few bales have been run through the machine. This will enable the operator to familiarize himself with the baler operation and capacity for the particular type of crop being baled.

NOTE: Do not operate P.T.O. driven balers at P.T.O. speeds in excess of 545 R.P.M. At this speed, the plunger will be operating at approximately 68 strokes per minute.

3. Check all bearings for overheating at frequent intervals.
4. Operate the tractor slowly at first, maintaining a speed that will permit an even flow of hay to the baler at all times. Decrease the forward speed when the windrow is heavy and increase the speed when the windrow is light.

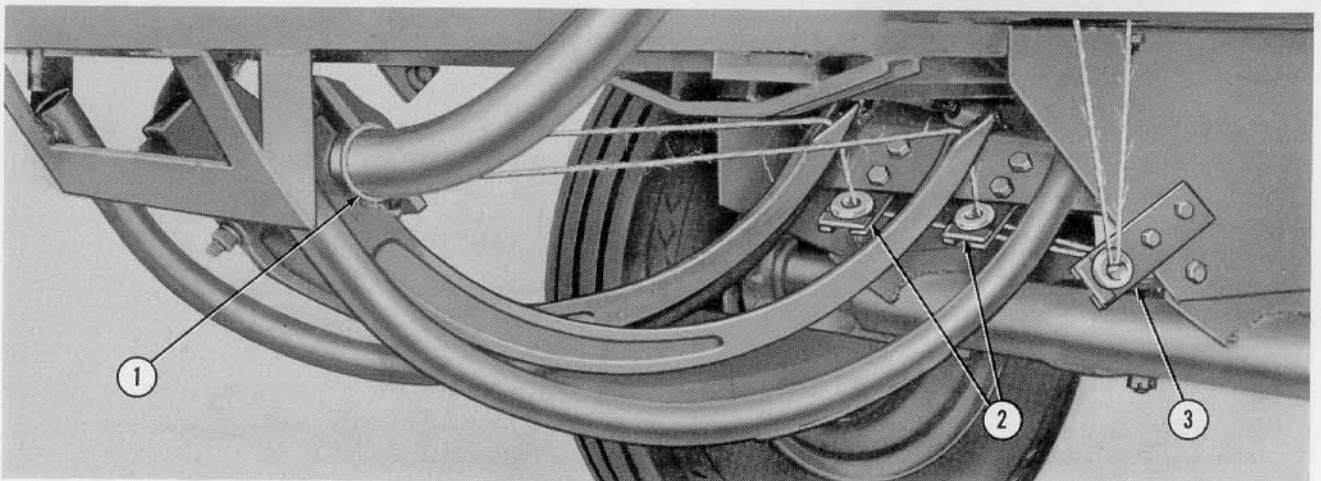


Figure 6
Threading Needles

OPERATION

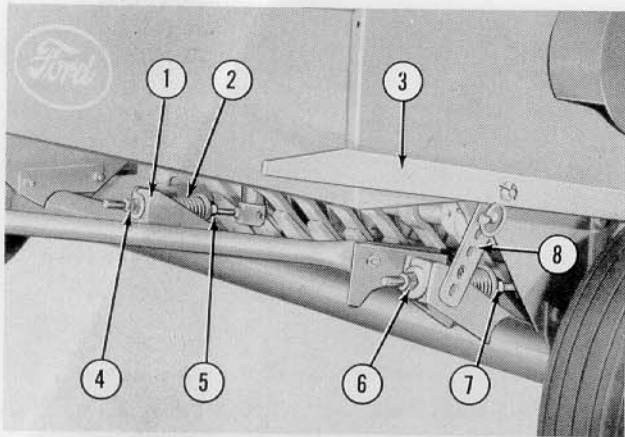


Figure 7

Pick-Up Lever, Counterbalance Springs & Stop Adjustment

ADJUSTMENTS

Pick-up Lift Lever: The pick-up lift lever (3), Figure 7, is used to vary the working height of the pick-up teeth. The pick-up may be set at the desired height by relocating the lever in the latch (8) and securing with the linch pin provided. The pick-up teeth should work below the top of the stubble without striking the ground.

Pickup Counterbalance Springs. The tension on the pick-up counterbalance springs (see 2, Figure 7), should be adjusted so that the pick-up will float with approximately 15 pounds weight at the hay hold-down

pipe when the pick-up lift lever (3) is set in the lowest hole in the latch (8), Figure 7. This tension may be varied, as desired, according to local crop conditions.

The pick-up tension is adjusted by loosening the jam nuts and turning the adjusting nuts (5) and (7), at the front of the counterbalance springs.

Pick-up Stop Adjustment. Pick-up stops are provided on the rear of the pick-up counterbalance spring bolts to limit the upward travel of the pick-up assembly.

To adjust the stops, raise the pick-up to transport position with the lift lever (3), Figure 7, and secure the lever in the top hole of the latch (8) with the linch pin provided. Tighten the pick-up adjusting stops (4) and (6) until they are against the counterbalance spring brackets (1). This setting will provide adequate clearance between the pick-up assembly and the sweep fork when the pick-up is raised.

Bale Tension: The Ford Hay Baler is equipped with spring loaded bale tension bars (2), Figure 8, which compensate for moderate variations in the crop being baled.

Different crops and varying moisture content may make it necessary to use more or less tension than is provided automatically. Coarse or green material requires less tension, while dry or fluffy materials require more tension. To apply more tension to the bales, tighten the tension handles (1), Figure 8. Decrease the bale tension by loosening the same handles.

Feed Clutch: The hay pick-up and auger are protected against overloading by a friction clutch (1), Figure 9, at the inner end of the auger-pick-up drive shaft.

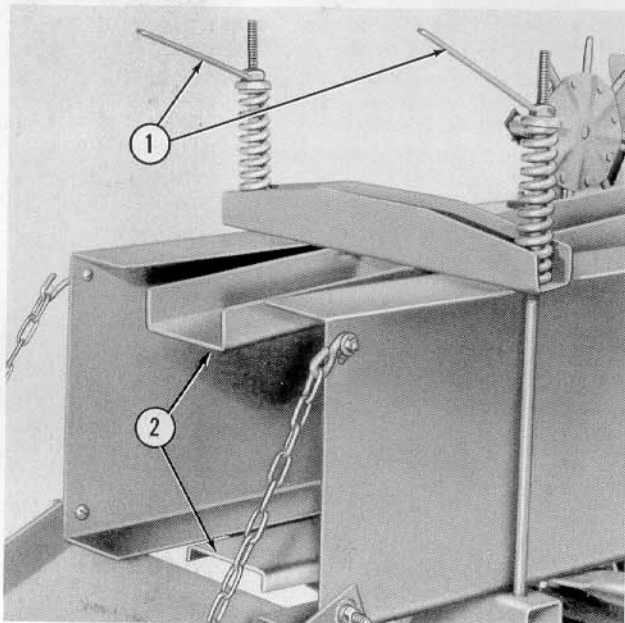


Figure 8

Bale Tension Adjustment

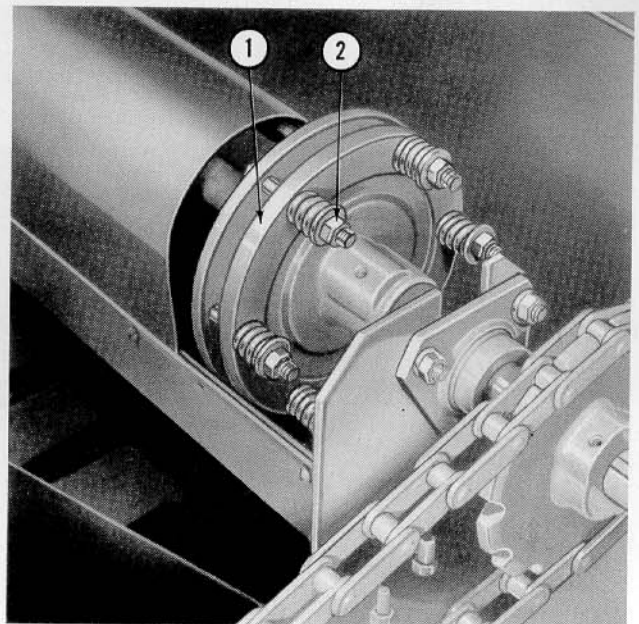


Figure 9

Feed Clutch Adjustment

OPERATION

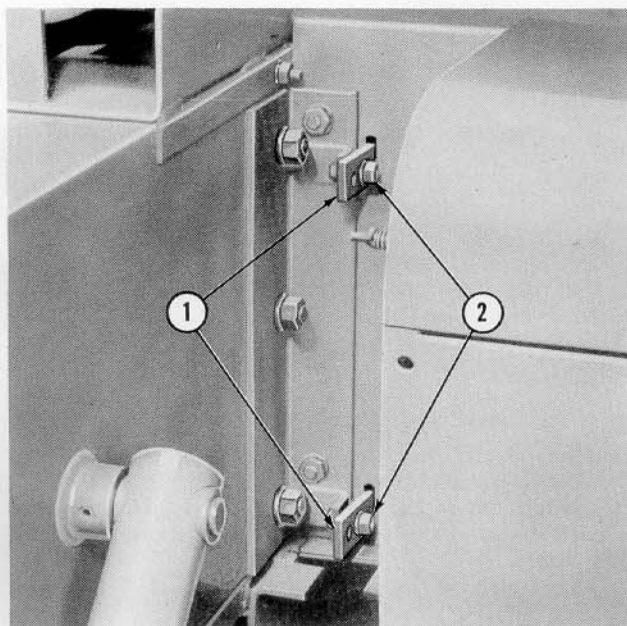


Figure 10
Feed Baffle Adjustment

Loosen the clutch until it slips excessively, then tighten it only as necessary to handle the crop. Tension may be adjusted by means of the six adjusting bolts (2), located on the hub flanges.

Feed Baffle: To aid in eliminating crescent shaped bales which "buckle" to the right or left, a special feed baffle is provided in the auger housing. The baffle is easily adjusted in or out by relocating the bolts (2),

Figure 10, in the brackets (1), which extend through the rear of the auger housing. Moving the baffle forward causes more hay to be placed in the far side of the bale chamber.

When both the feed baffle and the sweep fork arm are properly adjusted, hay will be uniformly distributed across the width of the bale chamber, resulting in even, uniform bales.

NOTE: Under certain baying conditions, it may be necessary to remove the feed baffle from the auger housing to obtain desired results.

Sweep Fork Arm: Density across the bale is regulated by the volume of hay being fed into the baler, the depth of sweep fork penetration into the bale chamber and the proper adjustment of the feed baffle (see Feed Baffle, this page). After the feed baffle has been adjusted to direct hay into the path of the sweep fork, increase or decrease the throw of the sweep fork arm in the following manner.

1. Loosen the jam nut (2), Figure 11, on the front end of the sweep fork drive rod.
2. Place a wrench on the indentation (1) in the drive rod and turn the rod until the desired length of throw is obtained. *At no time should the distance between the yoke centers (A) exceed $22\frac{1}{8}$ inches.*
3. Tighten the jam nut (2) securely.

Back-up Support Stud: The back-up support stud (3), Figure 11, on the right side of the gear box, protects the ring gear under heavy loads.

To adjust, loosen the jam nut (4) and turn the stud (3) clockwise until it is finger tight against the ring gear, then back the stud off $\frac{1}{8}$ turn and lock securely with the jam nut. The stud must be readjusted occasionally as wear occurs.

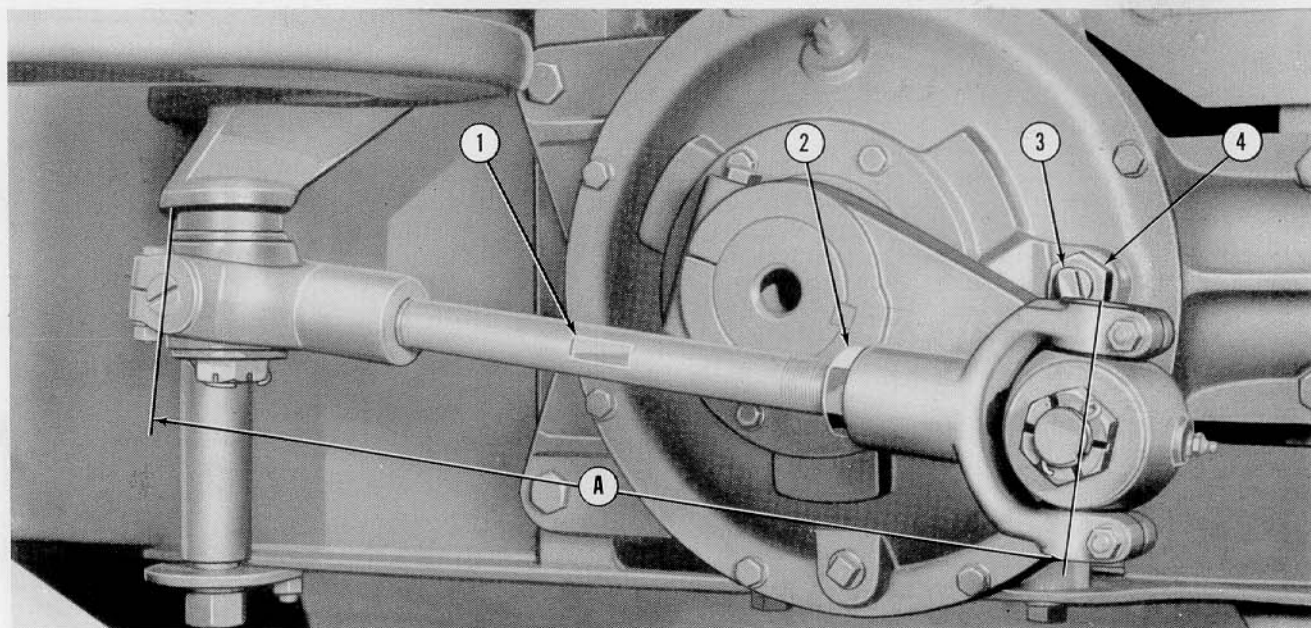


Figure 11
Sweep Fork and Back-up Support Stud Adjustment

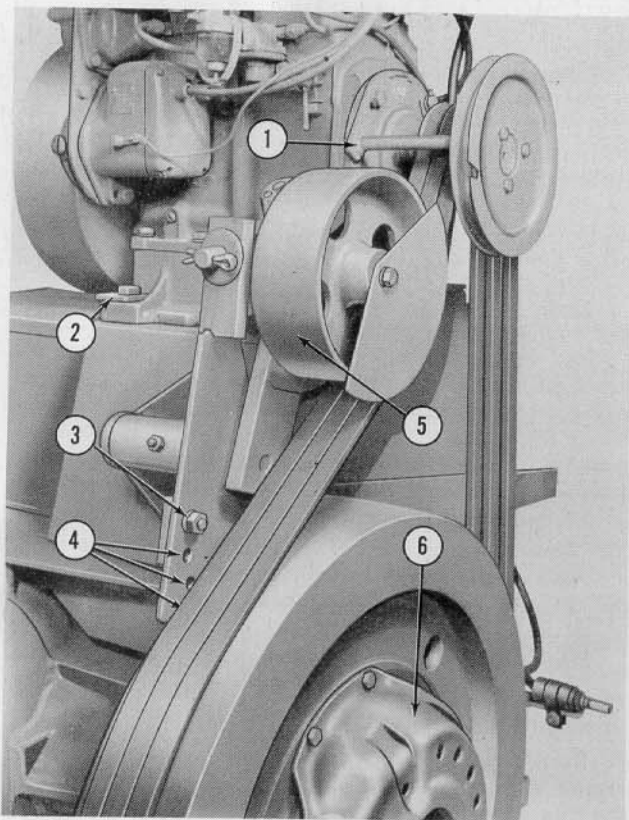


Figure 12

Drive Belt Tension & Flywheel Safety Clutch

V-Belt Guide: Adjust the belt guide (1), Figure 12, to clear the belts approximately $\frac{1}{8}$ inch when the idler pulley (5) is engaged as shown. If the guide is not properly adjusted, the V-belts may tend to turn the flywheel, even when the idler pulley is disengaged.

V-Belt Tension: Proper belt tension will be obtained when the spring on the idler pulley is compressed approximately halfway.

After an engine driven baler has been operated for a period of time, it may become necessary to make the following adjustments to compensate for stretch in the V-belts.

1. Belt tension may be increased by relocating the bolt (3), Figure 12, in the lower adjusting holes (4) provided in the idler arm.
2. If still greater tension adjustment is desired, the engine may be raised by means of the spacers (2), Figure 12, located on each engine mounting bolt.

Flywheel Safety Clutch: A pre-set, automotive type friction clutch (6), Figure 12, is provided on both engine and P.T.O. driven baler flywheels to prevent damage to the baler if the plunger becomes overloaded. The clutch does not require adjustment, however, during short storage periods between crops and at the end of each season, the pressure on the clutch

disc should always be relieved as described in the section on STORAGE, page 26, to avoid damage to the baler.

P.T.O. Drive Over-Running and Friction Clutch: Ford P.T.O. Driven Hay Balers are equipped with a special over-running clutch (3), Figure 13, and a spring washer type friction clutch (4) which provides additional protection for the tractor power line.

To adjust the friction clutch, tighten the six self-locking nuts (5) until the two front clutch plates are just touching, then back off the nuts $\frac{1}{4}$ to $\frac{1}{2}$ turn.

The over-running clutch does not require adjustment.

Chain Tension: All drive chains on the baler should be checked periodically for proper tension. To check the tension, tighten one span of the chain, allowing slack to accumulate in the opposite span. A $\frac{1}{2}$ " deflection should be maintained in all drive chains on the Ford Hay Baler.

The procedure for tightening individual drive chains is as follows.

1. Tension on the P.T.O. drive chain (2), Figure 13, (P.T.O. Balers only) is adjusted by means of the chain tightener (1).

NOTE: The P.T.O. clutch shield has been removed for purposes of illustration only.

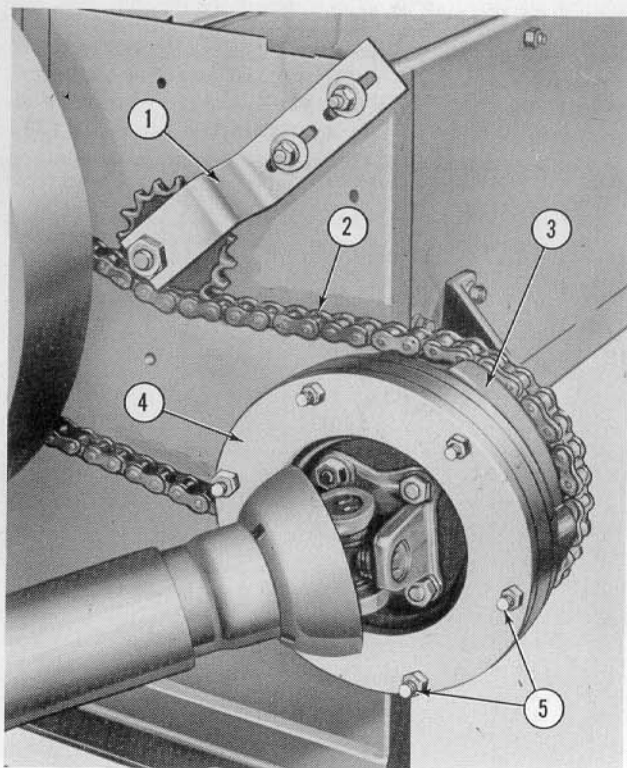


Figure 13

P.T.O. Drive Over-Running & Friction Clutch

OPERATION

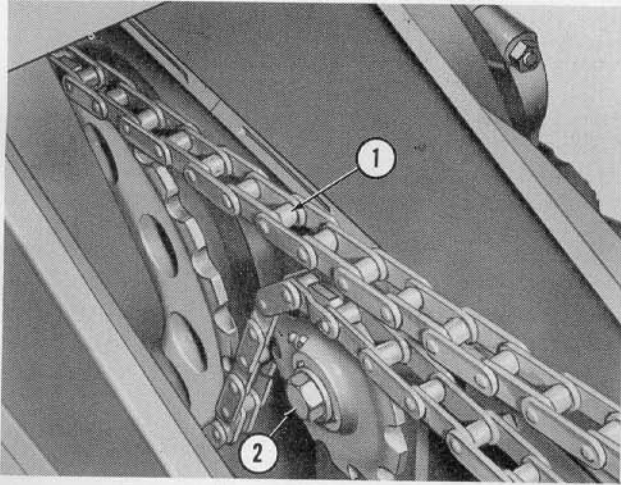


Figure 14
Main Drive Chain Tightener

2. The main drive chain (1), Figure 14, is adjusted for proper tension by moving the tightener (2) forward or rearward.
3. The auger drive chain (1), Figure 15, is adjusted by means of the tightener (2).
4. Tension on the primary and secondary pick-up drive chains (3) and (5), Figure 15, is controlled by means of the chain tighteners (4) and (6).

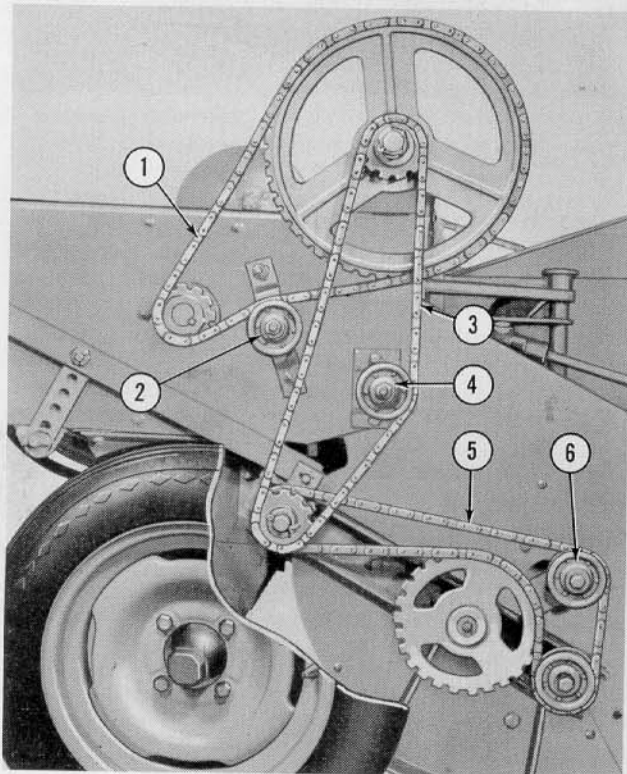


Figure 15
Auger & Pick-up Drive Chain Tighteners

5. Proper tension of the knotter drive chain (1), Figure 17, is maintained by the chain tightener (9).

Bale Lengths: The metering wheel on your Ford Hay Baler may be adjusted for bale lengths of 36 and 42 inches. To obtain 36 inch bales, the teeth (3), Figure 16, should extend approximately $1\frac{1}{2}$ inches beyond the metering wheel (1) with the bolts (4) in the lower holes as shown. To obtain 42 inch bales, adjust the metering wheel as follows:

1. Remove the hex nuts, lockwashers and bolts (4), Figure 16, and locate the metering wheel assembly in the middle two holes of the support bracket (5). Reinstall the bolts, lockwashers and hex nuts and tighten securely.
2. Loosen the eight bolts (2), Figure 16, in the metering wheel and move all the teeth out to approximately $2\frac{1}{4}$ inches from the wheel (1). Tighten the bolts (2) securely.

Hay Dogs: As each charge of hay is compressed in the chamber by the plunger head, hay dogs in the top and bottom of the bale chamber are forced out of the chamber by the hay and plunger. As the plunger starts its return stroke, the hay dogs should quickly "snap" back into the chamber, to hold the charge of hay in compression. Tension on the hay dog springs is increased by means of the draw bolt (2), Figure 17, and a similar draw bolt located under the baler.

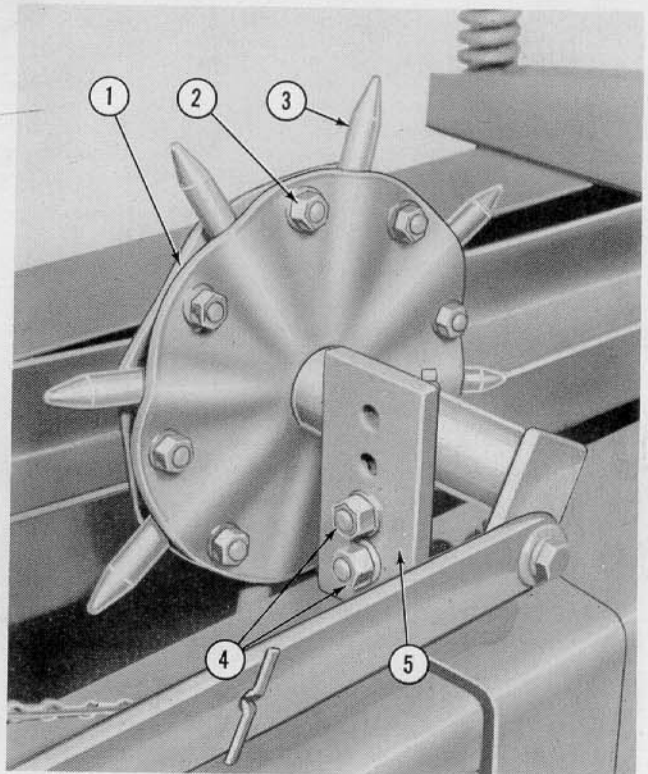


Figure 16
Adjusting the Metering Wheel

OPERATION

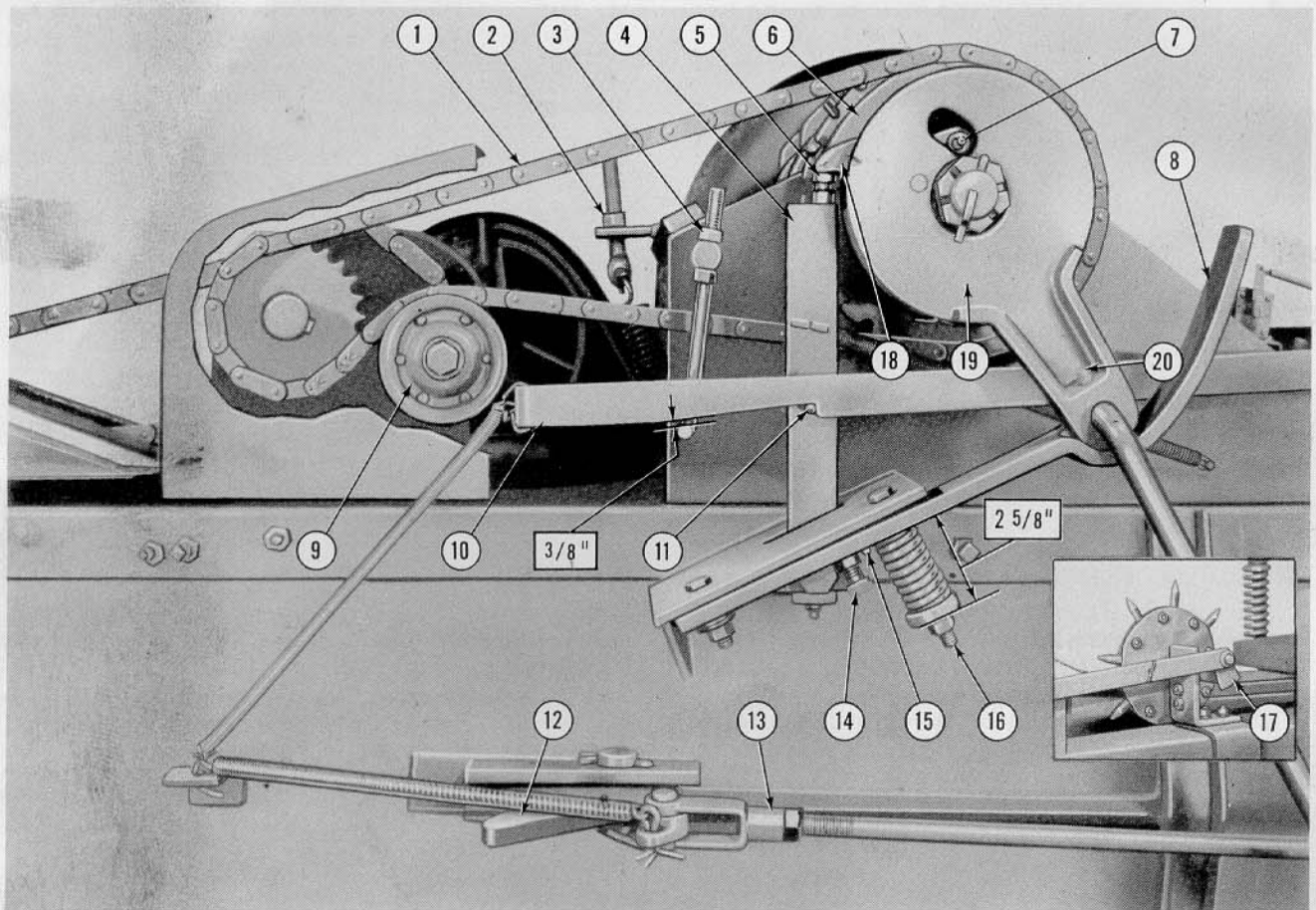


Figure 17
Timing the Ford Hay Baler

Clutch Trip Arm: Adjust the set screw (5), Figure 17, at the top of the clutch trip arm (4) as follows:

1. Seat the knotter arm (20) in the depression on the friction brake (8) as shown.
2. Rotate the baler flywheel until the clutch dog inside the knotter drive sprocket (6), Figure 17, is directly over the pawl roller (7).
3. Trip the knotter by pushing the trip arm (4), Figure 17, forward.
4. Adjust the set screw (5), Figure 17, so that the top of the set screw extends $\frac{1}{16}$ to $\frac{1}{8}$ inch above the bottom of the clutch pawl (18).

The set screw (15) located on the bottom of the clutch trip arm (4) limits the travel of the arm and prevents it from striking the knotter clutch housing and knotter drive sprocket. When properly adjusted, the front edge of the set screw (5) is flush with the front edge of the clutch pawl (18).

Knотter Trip Rod Return Lever: The trip rod return lever (10), Figure 17, should clear the knотter trip rod (10) by approximately $\frac{3}{8}$ " when the trip rod is in the tripping position against the pin (11) and the metering wheel arm (17) is in the "up" position as shown.

Adjust the lever (3) as necessary to obtain this clearance.

Needle Friction Brake: For proper tension on the needle friction brake (8), Figure 17, adjust the spring (16) to a length of approximately $2\frac{5}{8}$ inches as shown. A set screw (14) is provided to limit the movement of the friction brake. To adjust the set screw, seat the knотter arm (20) in the depression on the friction brake (8). Turn the set screw (14) in until it just touches the bracket, then back it off $\frac{1}{4}$ turn and lock with the jam nut.

Timing Procedure: To prevent damage to the baler, it is suggested that the operator periodically check the baler for proper timing as outlined below:

1. Trip the knотter by releasing the knотter clutch trip arm (4), Figure 17.
2. Turn the baler flywheel counter-clockwise (facing flywheel) until the needle points enter the baling chamber $\frac{1}{4}$ inch.

CAUTION: When turning the flywheel by hand on engine driven models, always disconnect the spark plug wires to prevent accidental starting of the engine.

OPERATION

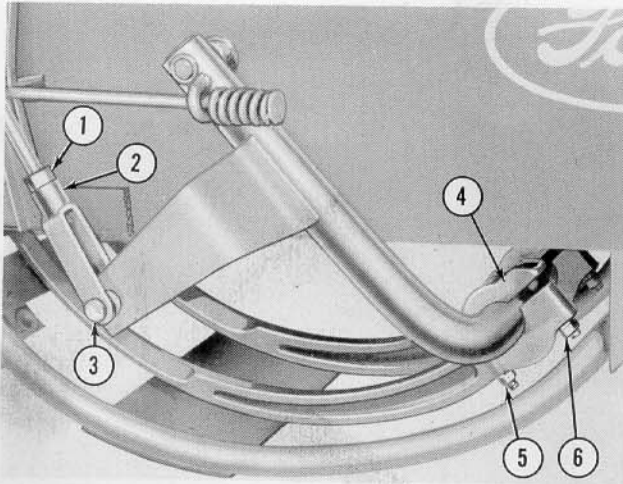


Figure 18

Adjusting Needles for Proper Height & Clearance

If the plunger vertical face is not $\frac{3}{4}$ inch past the needle points with the plunger on the compression stroke, the baler is not in time and should be corrected as follows:

NOTE: Before timing the baler, check the needles for proper height and clearance. See needle adjustment below.

1. Remove the drive chain (1), Figure 17, from the knotter clutch sprocket (6).
2. Turn the flywheel counter-clockwise until the vertical face of the plunger is about $\frac{3}{4}$ inch past the needle points with the plunger on the compression stroke.
3. Turn the knotter clutch sprocket (6), Figure 17, counter-clockwise until the clutch pawl roller (7) engages the dog inside the clutch sprocket.
4. Replace the knotter drive chain (1), Figure 17, taking the slack out of the top span and fastening the chain at the bottom.
5. Adjust the knotter drive chain tightener (9), Figure 17, until the top span of the chain can be depressed about $\frac{1}{2}$ inch.
6. Complete the tying cycle.
7. Trip the knotter mechanism, then turn the baler flywheel by hand and check to be sure that the timing is correct.

Plunger Head Lock: The plunger head lock (12), Figure 17, is provided as protection for the baler needles if the baler should get out of time. With the needles in the full down position, the inner edge of the latch should be flush with the outside of the bale chamber. The lock may be adjusted by means of the clevis (13).

Proper Height and Clearance of Needles: The needles are adjusted for proper height and clearance as follows:

1. Trip the knotter mechanism by releasing the knotter clutch trip arm (4), Figure 17, then turn

the flywheel counter-clockwise until the needles are at their uppermost position.

2. The clearance between the needles (2), Figure 19, and the twine discs (4) should be $\frac{1}{16}$ to $\frac{1}{8}$ inch as shown at (3). To bring the needles closer to the twine discs, loosen the rear bolts (6), Figure 18, on the needle clamp (4) and tighten the front bolts (5). To increase the distance, loosen the front bolts (5) and tighten the rear bolts (6).
3. The clearance between the needles (2), Figure 19, and the bill hook pinion (1) should be such that the needles just clear the pinion (1). To adjust, loosen the needle clamp bolts (5) and (6), Figure 18, and slide the needles to the right or left to obtain proper clearance. Retighten the needle clamp bolts securely.
4. The proper height of needle travel is determined by measuring the distance from the twine discs (4), Figure 19, to the bottom of the needle eyes. This distance should be from $1\frac{3}{4}$ to $2\frac{1}{4}$ inches as shown in Figure 19. To adjust the height, loosen the jam nut (1), Figure 18, remove the pin (3) and turn the clevis (2) on the needle yoke drive rod until the correct measurement is obtained.

CAUTION: After making the above adjustment, check to be sure that the needle yoke and clamp has at least $\frac{1}{4}$ inch clearance on both the forward and rearward swing, and the needle tips are at least $\frac{1}{2}$ inch below the bottom of the bale chamber when the needle yoke is in the rearmost position.

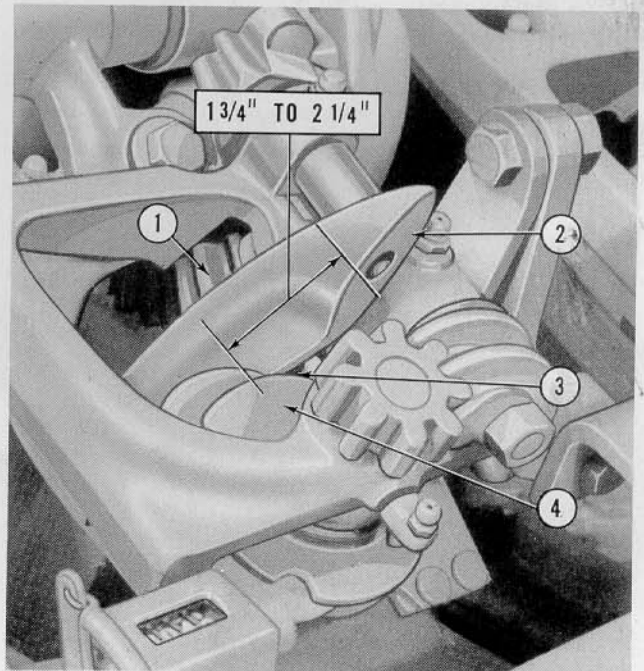


Figure 19

Proper Height and Clearance of Needles

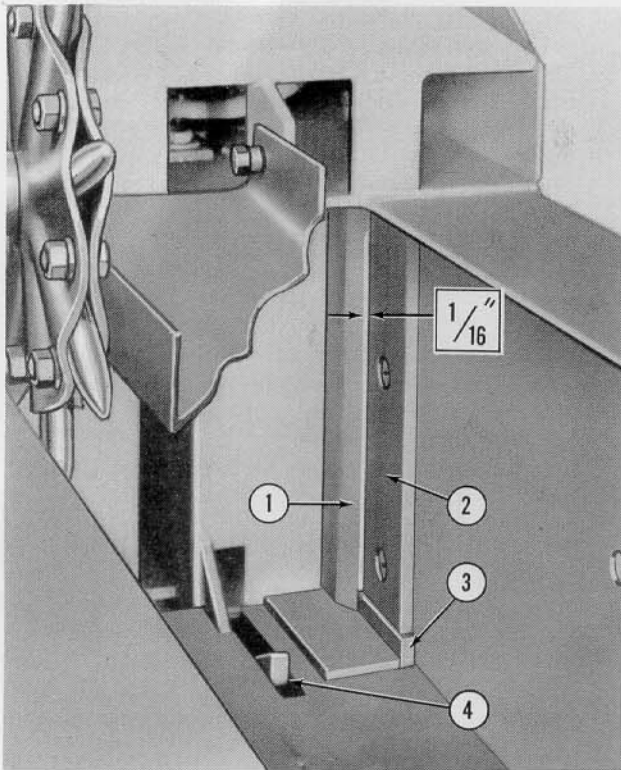


Figure 20

Plunger and Stationary Knife Clearance

Plunger Runners and Knife: To provide a clean cut and to prevent strain on the baler plunger, a clearance of approximately $\frac{1}{16}$ inch should be maintained between the plunger knife (1), Figure 20, and the stationary knife (2). Both knives should be removed and sharpened as required, maintaining the original bevel as near as possible.

As the wood plunger runners become worn, the knife clearance will increase and the plunger will develop side play. When this happens, adjust the plunger runners for minor side wear as follows:

1. Loosen the nuts on the six wear angle retaining bolts (top and bottom of bale chamber). See (1), Figure 21.
2. Loosen the nuts on the six pull bolts (2), Figure 21, on the side of the bale chamber.
3. Loosen the jam nuts on the six adjusting set screws (3), Figure 21, and tighten the set screws until the plunger head fits snugly against the right side of the bale chamber without binding. This will eliminate plunger side play and should provide the proper $\frac{1}{16}$ inch clearance between the plunger and stationary knives.
4. Tighten the nuts on the retaining bolts (1), Figure 21, pull bolts (2) and adjusting set screws (3).

NOTE: After adjusting for minor side wear, check the knives for proper clearance.

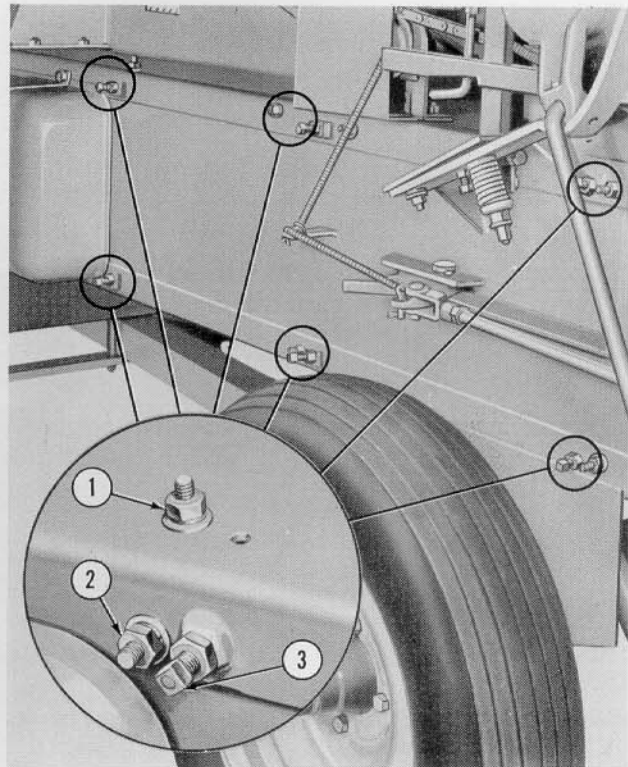


Figure 21

Adjusting Plunger Runners and Knife

Shimming Plunger Runners: When plunger runners and the upper and lower stationary wear strips (see 3, Figure 20) become worn to such an extent that there is danger of the plunger and stationary knives striking, it will be necessary to remove the plunger from the baler and shim all plunger runners to compensate for vertical and/or horizontal wear.

1. Remove the bolt, lockwasher and nut (2), Figure 22, which secures the connecting rod to the connecting rod bearing (1).
 2. Depress the lower hay dogs (see 4, Figure 20) and lock them out of the bale chamber.
 3. Remove the metering wheel (1), Figure 16.
 4. Release the tension on the bale tension bars.
- NOTE:** The upper bale tension bar has been removed in Figure 22 for purposes of illustration. While complete removal of the upper bar is not required, it will facilitate removal of the plunger (3).
5. Loosen the nuts on the six wear angle retaining bolts (see 1, Figure 21) and back off the adjusting set screws (3).
 6. Tighten the nuts on the six pull bolts (2), Figure 21, to pull the wear angles against the side of the bale chamber.
 7. Rotate the baler flywheel until the plunger is at full stroke, then remove the plunger (3), Figure 22, from the rear of the bale chamber.

OPERATION

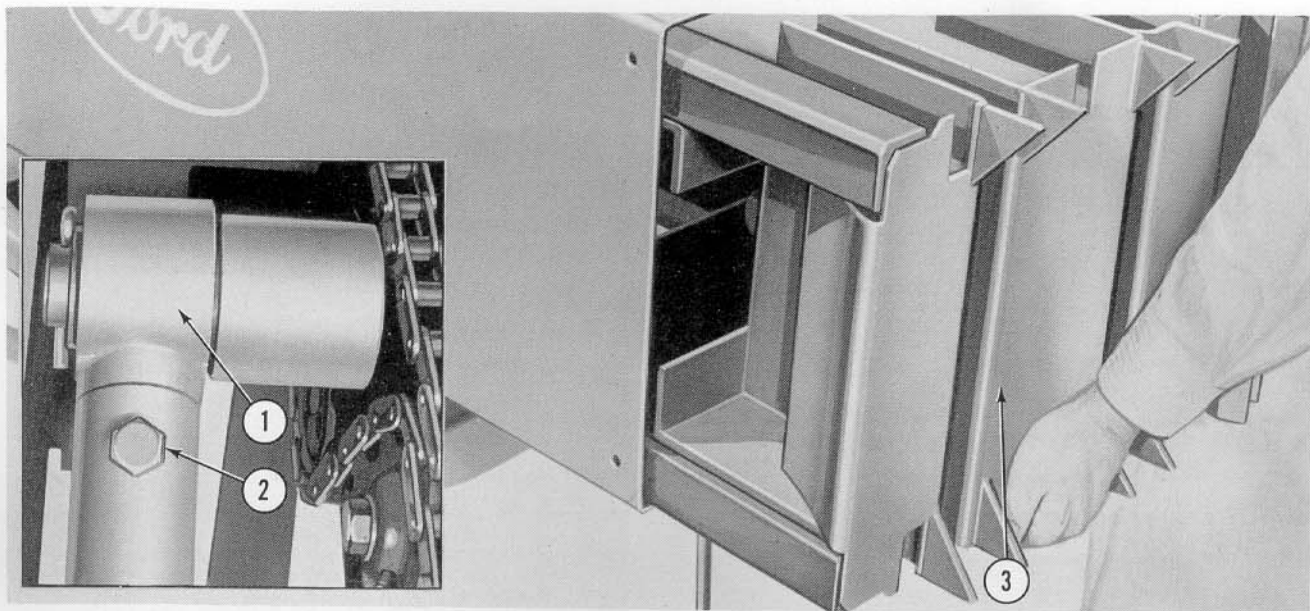


Figure 22

Removing Plunger from Baler

- To eliminate horizontal side play, loosen the nuts (see 5, Figure 23) on the bolts in the upper and lower right runners. Insert shims (1) and (4) (Part No. 147275) between the mounting angles (2) and runners (3). When properly shimmed, the metal wear plates (2), Figure 24, on the runners should extend approximately $\frac{1}{16}$ inch beyond the plunger knife (3) as shown.

The upper and lower stationary wear strips (see 3, Figure 20), should extend approximately $\frac{1}{32}$ " beyond the face of the stationary knife (2). Wear strip shims (Part No. 148356) are available for use behind the stationary strips. Proper shimming of the wear strips is necessary to prevent the knives from striking.

NOTE: Check to be sure that the face of the plunger knife (3), Figure 24, is vertically aligned

with the plunger wear plates (2). The wear plates may be inverted when excessive wear occurs.

- To eliminate vertical play in the plunger, loosen the retaining nuts in all four runners and insert shims (Part No. 148288) as shown at (1), Figure 24. Proper clearance between the top of the plunger runners and the upper wear strip in the bale chamber is approximately $\frac{1}{16}$ inch. The clearance between the plunger face and the top of the bale chamber should not exceed $\frac{3}{16}$ inch.
- Reinstall the plunger in the baler, taking care not to damage the runners on the lower wear strips. Reinstall the metering wheel, release the lower hay dogs, tighten the bale tension bars and re-adjust the wear angles by means of the set screws (3), Figure 21, as previously outlined above.

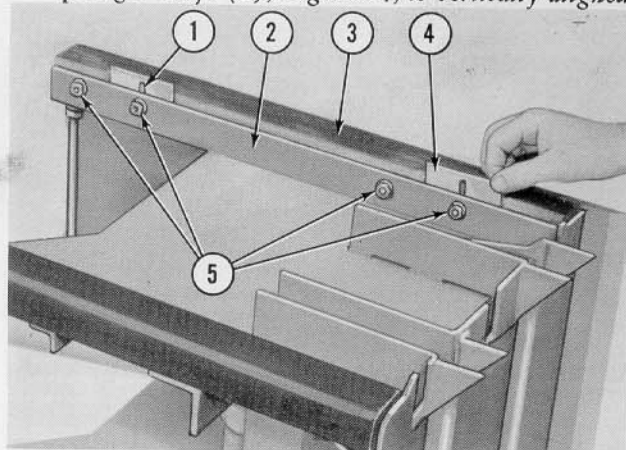


Figure 23

Shimming for Horizontal Wear

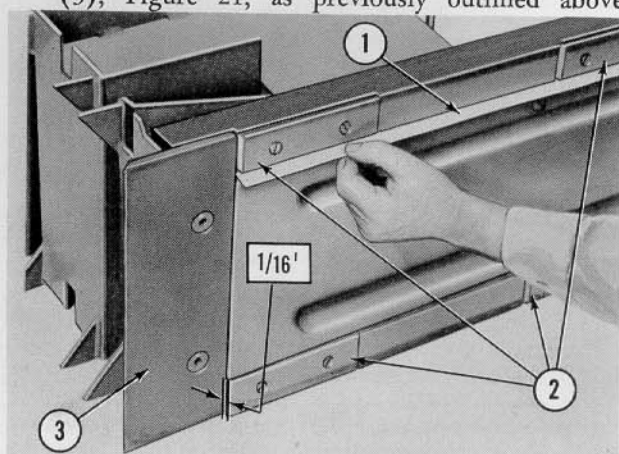


Figure 24

Shimming for Vertical Wear

OPERATION

HOW THE KNOTTER WORKS

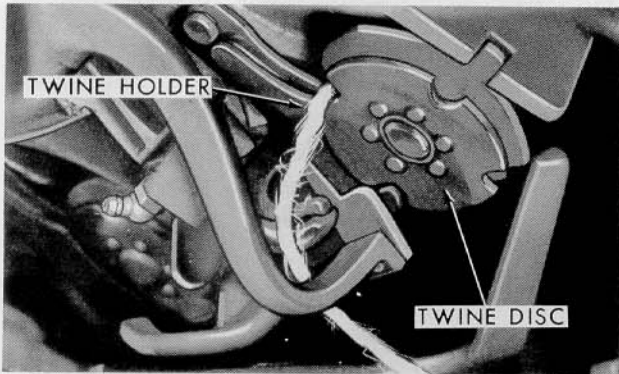


Figure A

Step 1: The top strand of twine is held in the twine disc by the twine holder while the bale is being formed. Twine is pulled around the bale from the twine can.

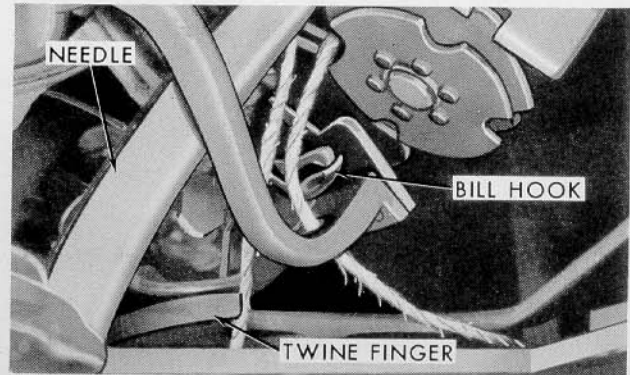


Figure B

Step 2: At the proper bale length, the metering wheel trips the knoter mechanism and the needle comes up through the plunger, placing the lower strand of twine in the twine disc. The twine finger moves toward the rear, pushing the twine toward the bill hook.

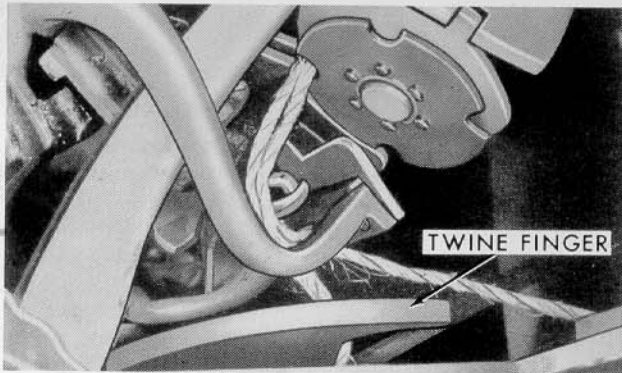


Figure C

Step 3: Both strands of twine are held in the twine disc as the disc starts to revolve. The twine finger holds the lower strand tightly against the bill hook as the bill hook starts to revolve.

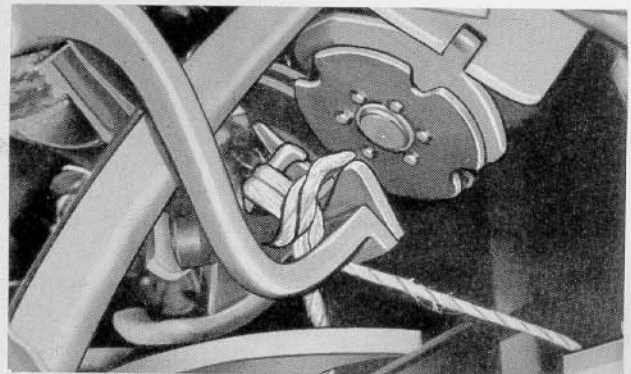


Figure D

Step 4: The twine disc revolves to the next notch as the bill hook turns to form a loop and opens to grasp the two strands of twine leading to the twine disc.

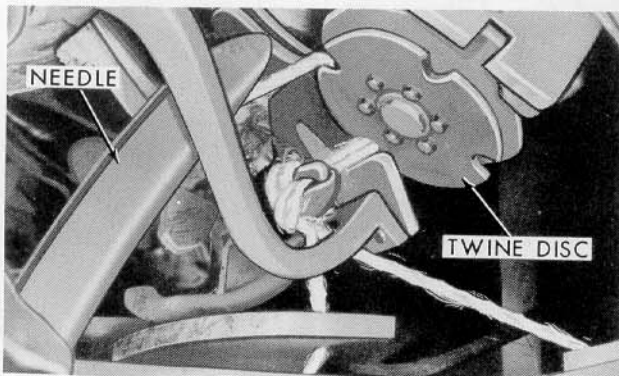


Figure E

Step 5: The bill hook completes its revolution and closes on the twine, holding it tightly. The needle, now on the down stroke, places the twine in the next notch of the twine disc.

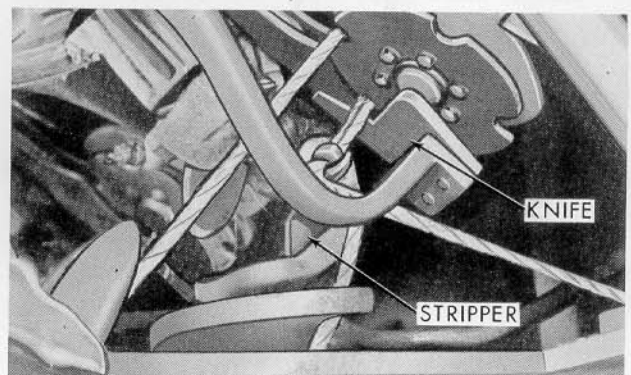


Figure F

Step 6: The twine knife cuts the double strand of twine, after which the stripper wipes it from the bill hook and completes the knot. The twine finger returns to its forward position while the needle is on the down stroke.

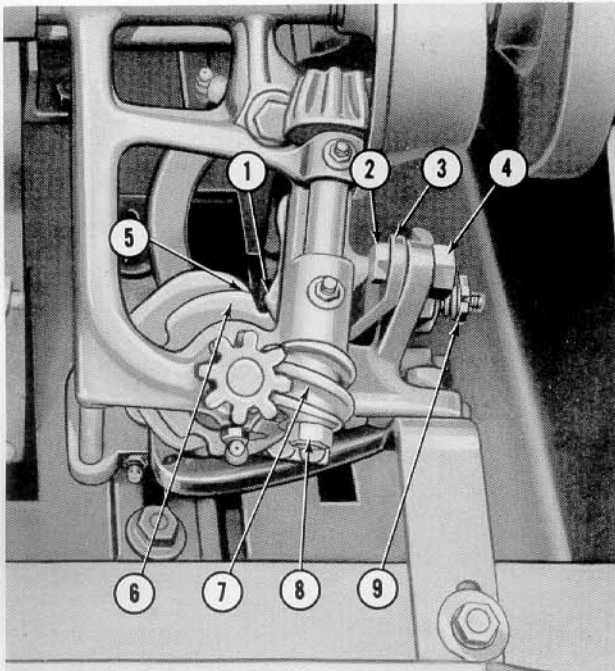


Figure 25

Adjusting the Twine Holder and Twine Disc

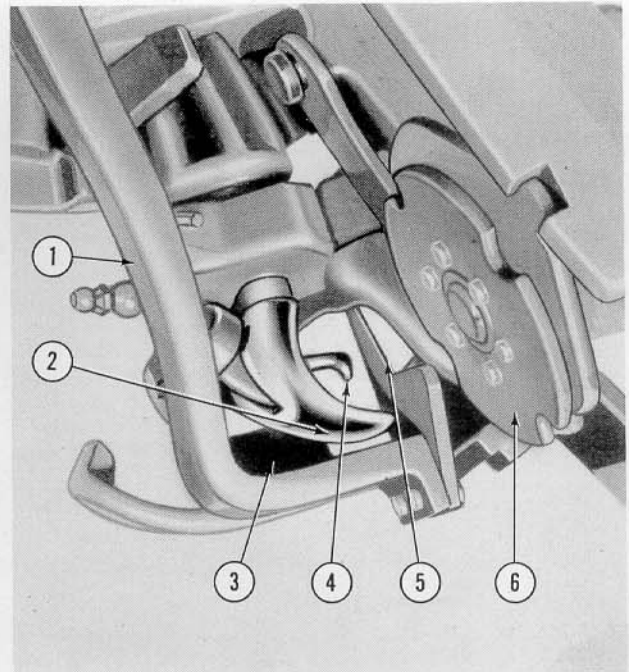


Figure 26

Adjusting the Bill Hook and Twine Knife

KNOTTERS

A study of the knotter mechanism on the Ford Hay Baler will aid the operator in understanding the function of the component parts and will thereby enable him to make necessary adjustments quickly and more easily. A series of illustrations (page 16) is provided to show knotter action during the various stages of forming and tying a knot.

NOTE: Before putting the new Ford Hay Baler into operation, the protective coating of grease applied to all knotter parts prior to shipment should be removed. It is especially important that the coating be removed from the bill hooks and twine discs.

Individual parts of the knotter assemblies are adjusted as follows:

Twine Holder: The function of the twine holder (1), Figure 25, is to hold the baling twine under pressure in the twine disc (6). Insufficient tension on the twine holder permits the twine to be pulled out of the twine disc, resulting in failure to form a knot in the strand of twine over the top of the bale or resulting in knots with one end $\frac{1}{2}$ inch or more longer than the other. In some cases, the longer end may be tucked into the knot, forming a single loop.

NOTE: Excessive twine tension at the twine can, excessive bale tension or a dull twine knife may also cause the twine to be pulled from the twine disc (6). These adjustments should be checked and corrected before changing the tension on the twine holder.

Excessive tension on the twine holder (1) may cause the twine to be broken by the bill hook. This can result in failure to form a knot in either end of the twine around the bale and may also cause increased wear on the knotter cam gears.

To adjust the tension on the twine holder, loosen the jam nut (4), Figure 25, and turn the bolt (2) against the disc spring (3). Increase or decrease the tension gradually by turning the bolt (2) $\frac{1}{4}$ turn at a time. After adjusting, tighten the jam nut (4) securely.

Twine Disc: When the twine disc (6), Figure 25, is properly adjusted to receive twine, the left side of the notch in the disc should be flush with the edge of the cleaner plate (5) as shown. To adjust the twine disc, loosen the nut (8) and loosen the worm gear (7) on its tapered shaft. Rotate the worm gear (7) as necessary to advance or retard the twine disc, then tighten the nut (8) to lock the worm gear in position.

Bill Hook: Proper bill hook tension is an important factor in the tying operation. If the tension on the bill hook is insufficient, knots may be loosely tied and may pull apart. Too much tension, however, may result in the bill hook holding the ends of the twine, causing excessive knotter wear and occasional twine breakage. Adjust the bill hook tongue (4), Figure 26, for proper tension by removing the cotter pin and either tightening or loosening the castellated nut (9), Figure 25, one quarter turn at a time. When the desired tension is obtained, replace the cotter pin in the nut.

OPERATION

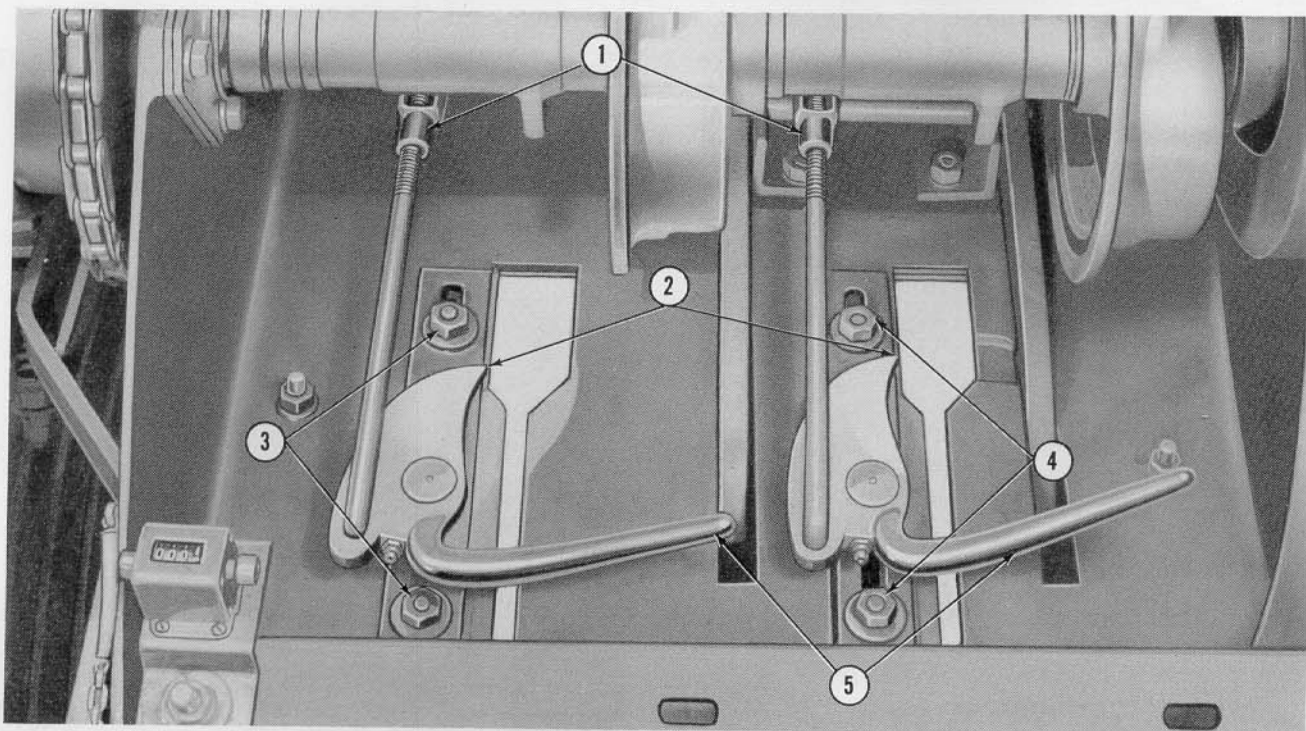


Figure 27

Adjusting the Twine Fingers

Knife and Stripper: As the bill hook (2), Figure 26, revolves and picks up the twine from the twine disc (6), the knife (5) swings between the bill hook and twine disc, cutting the twine. The stripper flange (3) then rides along the heel of the bill hook (2), stripping the loop of the knot off the bill hook to complete the tying operation.

The stripper flange (3), Figure 26, should start contacting the curved surface of the bill hook heel about $\frac{5}{8}$ to $\frac{11}{16}$ inch from the tip end of the bill hook and with sufficient pressure to wipe the knot off the bill hook. If necessary, the knife arm (1) may be adjusted by bending it carefully.

NOTE: The knotter knife blades (see 5, Figure 26) should be sharpened when they become dull.

Twine Fingers: It is the function of the twine fingers (2), Figure 27, to pick up the twine brought through the slots in the top of the bale chamber by the needles and hold it in the proper position against the bill hooks. (See 2, Figure 26).

To adjust the twine fingers, proceed as follows:

1. Check to be sure that the needles are properly adjusted. See page 13.
2. Disconnect the spark plug wires, trip the knotter mechanism and turn the flywheel counter-clockwise until the needles pass through the slots in the top of the bale chamber and the twine finger points (2), Figure 27, start to rotate across the needle slots.

3. Remove the cotter pins and clevis pins from the clevises (1), Figure 27.
4. Loosen the hex nuts (3) and (4), Figure 27, which hold the twine finger assemblies to the frame. Move the assemblies forward or backward until the clearance between the twine fingers and the needles is approximately $\frac{1}{8}$ to $\frac{1}{4}$ inch, and so the twine fingers will pick up the twine as they rotate across the needle slots. Retighten the nuts (3) and (4) securely.
5. Turn the flywheel until the needles are in the full down position and the knotter clutch is disengaged.
6. Turn the clevises (1), Figure 27, until the twine fingers (2) are nearly flush with the left edge of the needle slots in the top of the bale chamber as shown. Reattach the clevises to the cam tracer arms with the clevis pins and cotter pins.

NOTE: When making this adjustment, pull lightly to the rear on the twine finger tails (5) to remove any play in the linkage and to be certain that the points (2) will not extend over the needle slots.

7. With twine threaded through the baler needles, turn the flywheel slowly until the needles are at their uppermost position, then observe the position of the twine against the bill hooks. When properly adjusted, the twine fingers should hold the twine against the bill hook so that the twine will not slip off as the bill hook starts to rotate. See Figure C, page 16.

OPERATION

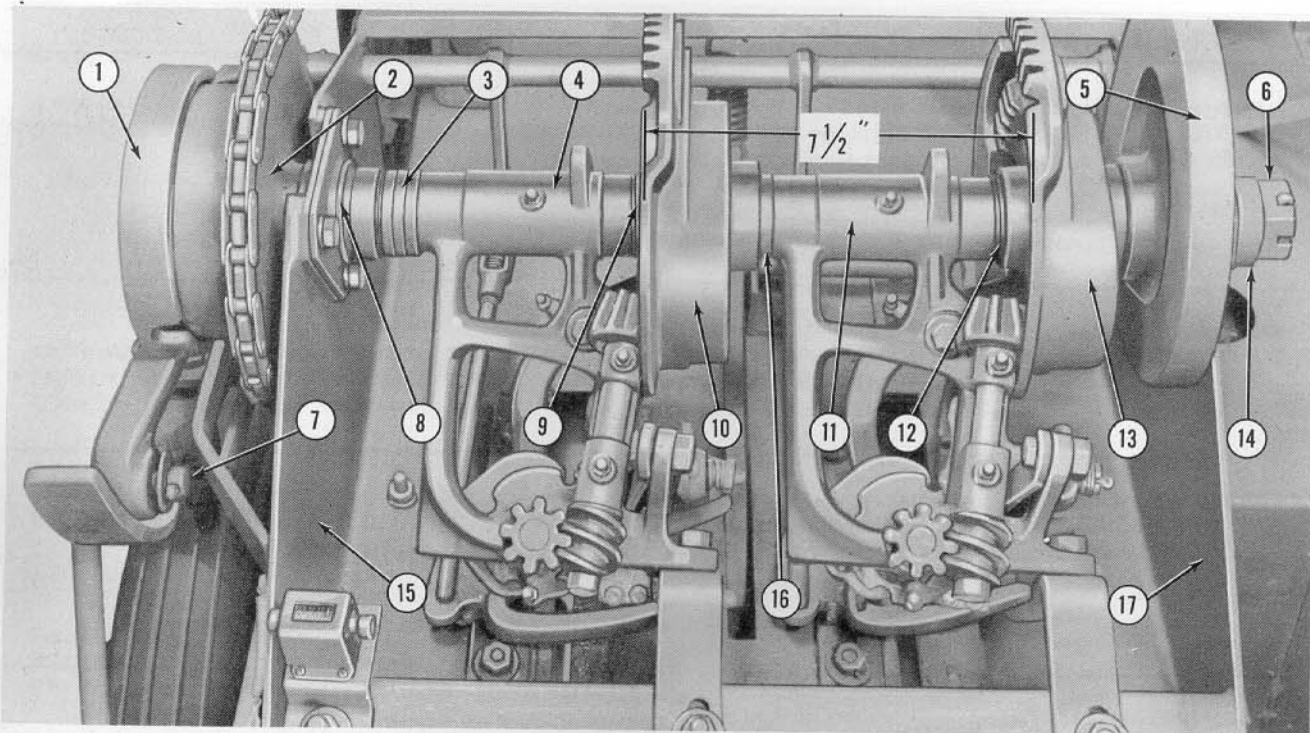


Figure 28

Installing Knotter Assemblies

ASSEMBLING THE KNOTTERS

When knotter assemblies are removed from the knotter shaft for servicing, they should be reassembled on the shaft in the following manner:

1. Inspect the knotter shaft for bends, worn keyways or other defects.
2. Examine all knotter parts, replacing those which show signs of excessive wear.

NOTE: Unless new parts are being installed, all spacer washers and parts should be reassembled in their original order on the shaft.

3. Turn the castellated nut (6), Figure 28, on the right end of the knotter shaft until the cotter pin can be inserted.
4. Install the right hand flanged bearing (14), Figure 28, with the collar to the right as shown. Do not tighten the Allen screws in the bearing at this time.
5. Install the knotter cam (5), Figure 28, on the shaft.
6. Install the knotter cam gear (13), Figure 28, on the shaft as shown.
7. Install spacer washers (12), Figure 28, as needed, then install the right knotter assembly (11). Spacer washers (12) should be added or removed until the flats of the knotter pinions ride squarely against the machined surfaces of the cam gear without binding.
8. Install spacer washers (16) as required, then install the left knotter cam gear (10), Figure 28, as shown. The distance between the machined

surfaces on the cam gears should be $7\frac{1}{2}$ inches as shown.

9. Position the left knotter assembly (4) on the shaft, adding washers at (9), Figure 28, for relation of the pinion and cam gear as outlined in step 7 above.
10. Install spacer washers (3), Figure 28, as needed, then place the left flanged bearing (8) on the shaft.
11. Attach the right and left bearings on the right side of the mounting brackets (15) and (17), Figure 28.
12. Position the knotter driven sprocket (2), Figure 28, on the left end of the shaft. Add or remove washers until the knotter driven sprocket is properly aligned with the drive sprocket.
13. Place the $\frac{1}{32}$ inch flat washer on the shaft and install the knotter clutch (1), Figure 28. Secure with the washer and castellated nut. Tighten the castellated nuts on each end of the knotter shaft until the assembly is snug without binding.
14. Tighten the Allen screw in each bearing securely.
15. Back off the nut on the left end of the knotter shaft until the knotter clutch sprocket turns freely, then install cotter pins through both castellated nuts. Tighten the Allen screws in the knotter clutch (1), Figure 28.
16. Connect the needle yoke drive rod to the knotter clutch arm as shown at (7), Figure 28.
17. Readjust the needles as outlined on page 13 and time the baler as directed on page 12.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
FLYWHEEL CLUTCH OPERATES EXCESSIVELY	<ol style="list-style-type: none"> 1. Foreign object in hay. 2. Dull cutting knives. 3. Knives out of adjustment. 4. Bale tension too great. 5. Needles out of time. 6. Safety lock out of adjustment. 	<ol style="list-style-type: none"> 1. Remove object from hay. 2. Sharpen knives. 3. Adjust knives. 4. Decrease bale tension. 5. Time needles. 6. Adjust safety lock.
SAFETY LOCK FAILS TO OPERATE	<ol style="list-style-type: none"> 1. Spring weak or broken. 2. Safety lock rod bent or twisted. 3. Safety lock pin frozen or rusty. 4. Safety lock pin badly worn. 	<ol style="list-style-type: none"> 1. Replace spring. 2. Straighten or turn rod to proper position. 3. Free up and oil pin. 4. Replace pin.
FAILURE TO PICK UP HAY THOROUGHLY	<ol style="list-style-type: none"> 1. Hay not completely raked. 2. Not traveling direction of mower and rake. 3. Excessive ground speed. 4. Pick-up too high off ground. 5. Broken or bent pick-up fingers. 	<ol style="list-style-type: none"> 1. Rake hay properly. 2. Travel direction of mower and rake. 3. Decrease ground speed. 4. Lower pick-up slightly and check pick-up spring tension. 5. Replace or straighten fingers.
MIS-SHAPED BALES	<ol style="list-style-type: none"> 1. Bale short on right side. 2. Bale short on left side. 3. Bale short on top. 4. Dull cutting knives. 5. Knives out of adjustment. 	<ol style="list-style-type: none"> 1. Adjust feed baffle and/or sweep fork. 2. Adjust feed baffle and/or sweep fork. 3. Increase size of windrow, increase ground speed or increase bale tension. 4. Sharpen knives. 5. Adjust knives.
BROKEN NEEDLES	<ol style="list-style-type: none"> 1. Needles out of time. 2. Needle slots in plunger plugged. 3. Needles striking frame or plunger. 4. Needles loose on yoke. 5. Needles out of adjustment. 	<ol style="list-style-type: none"> 1. Time needles. 2. Clean out needle slots. 3. Adjust needles. 4. Adjust and tighten needles. 5. Adjust needles.
KNOTS HANGING ON BILL HOOK	<ol style="list-style-type: none"> 1. Stripper not operating properly. 2. Too much tension on bill hook. 	<ol style="list-style-type: none"> 1. Adjust stripper. 2. Decrease tension on bill hook.
KNOT TIED, BUT LOOP IN END OF TWINE—BOTH ENDS SAME LENGTH	<ol style="list-style-type: none"> 1. Too little tension on bill hook. 2. Worn bill hook. 	<ol style="list-style-type: none"> 1. Increase tension on bill hook. 2. Replace bill hook.
KNOT TIED, BUT LOOP IN ONE END OF TWINE—ONE END LONGER THAN OTHER (See Figures 29 and 30)	<ol style="list-style-type: none"> 1. Too little tension on twine holder. 2. Dull twine knife. 3. Excessive bale tension. 4. Excessive twine can tension. 	<ol style="list-style-type: none"> 1. Increase tension on twine holder. 2. Sharpen twine knife. 3. Reduce bale tension. 4. Reduce twine tension.
KNOT IN FRONT STRAND ONLY	<ol style="list-style-type: none"> 1. Too little tension on twine holder. 2. Bale tension too great. 3. Twine can tension too great. 	<ol style="list-style-type: none"> 1. Increase tension on twine holder. 2. Decrease bale tension. 3. Decrease twine can tension.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
KNOT IN TOP STRAND ONLY	<ol style="list-style-type: none"> 1. Improper needle adjustment. 2. Improper twine finger adjustment. 3. Plunger too low allowing hay to accumulate on top of plunger. 4. Hay collecting under dogs. 5. Broken or weak dog springs. 6. Too little twine can tension. 	<ol style="list-style-type: none"> 1. Adjust needles. 2. Adjust twine fingers. 3. Raise plunger. 4. Remove hay. 5. Replace dog springs. 6. Increase twine can tension.
NO KNOT IN EITHER END OF TWINE—LOOSELY TIED KNOT	<ol style="list-style-type: none"> 1. Too little tension on bill hook. 2. Worn bill hook. 3. Excessive twine holder tension. 	<ol style="list-style-type: none"> 1. Increase tension on bill hook. 2. Replace bill hook. 3. Reduce twine holder tension.
TWINE BREAKING IN KNOT	<ol style="list-style-type: none"> 1. Excessive clearance between stripper flange and heel of bill hook. 2. Too much tension on twine holder. 	<ol style="list-style-type: none"> 1. Adjust stripper. 2. Decrease tension on twine holder.
TWINE FRAYED NEAR KNOT (See Figure 31)	<ol style="list-style-type: none"> 1. At 1/2"—Rough stripper arm. 2. At 1 3/4"—Rough twine finger. 3. At 2 1/2"—Rough top needle slot. 4. At 16-18"—Rough bottom needle slot. 	<ol style="list-style-type: none"> 1. Smooth up stripper arm. 2. Smooth up twine finger. 3. Smooth up top needle slot. 4. Smooth up bottom needle slot.
TWINE ON MIS-TIED BALE OR BALES TIED TO PREVIOUS BALE	<ol style="list-style-type: none"> 1. Twine not picked up by twine disc because: <ol style="list-style-type: none"> a. Excessive needle to twine disc clearance. b. Twine disc out of time. 	<ol style="list-style-type: none"> a. Adjust needles. b. Time twine disc.
TWINE DISC DOES NOT STAY IN TIME	<ol style="list-style-type: none"> 1. Worn gears. 2. Twine disc pinion sheared or worn. 3. Worm slips on tapered shaft. 	<ol style="list-style-type: none"> 1. Replace gears if badly worn. 2. Replace pin. 3. Tighten nut if loose or replace shaft or gear.

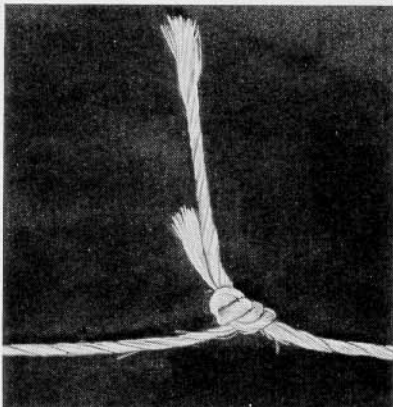


Figure 29

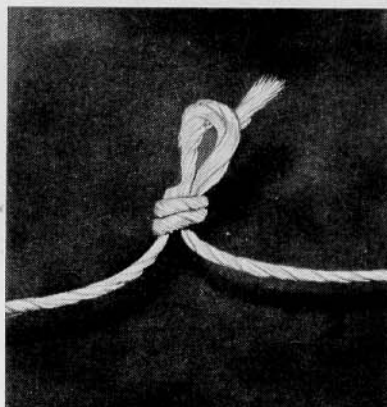


Figure 30

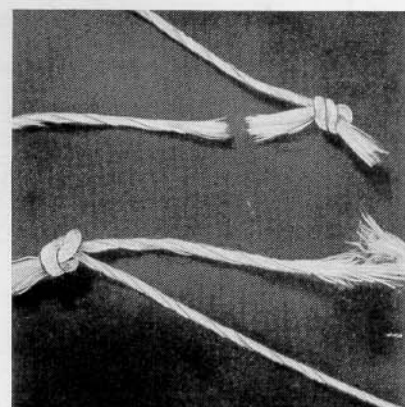


Figure 31

LUBRICATION

Proper lubrication is a vitally important factor in the efficient operation and long life of the baler. Consequently, the operator must become thoroughly familiar with the location of all lubricating points on the baler and follow a systematic procedure to assure thorough and quick lubrication. It is recommended, therefore, that the operator start at Fitting No. 1 (Chart "A") and lubricate the baler in accordance with the sequence shown on the lubrication charts.

Lubricate all grease fittings **TWICE DAILY** under normal operating conditions. Wipe the fittings clean, force a sufficient amount of grease into each fitting, then wipe off all excess grease.

The wheels on the baler are equipped with tapered

roller bearings and should be cleaned and repacked with wheel bearing grease once a year.

The main drive idler pulley on engine driven balers is subject to a high degree of friction during operation and should be lubricated more frequently than other points on the baler. Wipe this fitting clean to prevent grease from getting on the drive belts where it will cause slippage and deterioration.

Remove the level plug in the side of the gear box (see Lubrication Chart "A") and check the level of the oil. If low, fill to the level plug with SAE 90 E.P. oil.

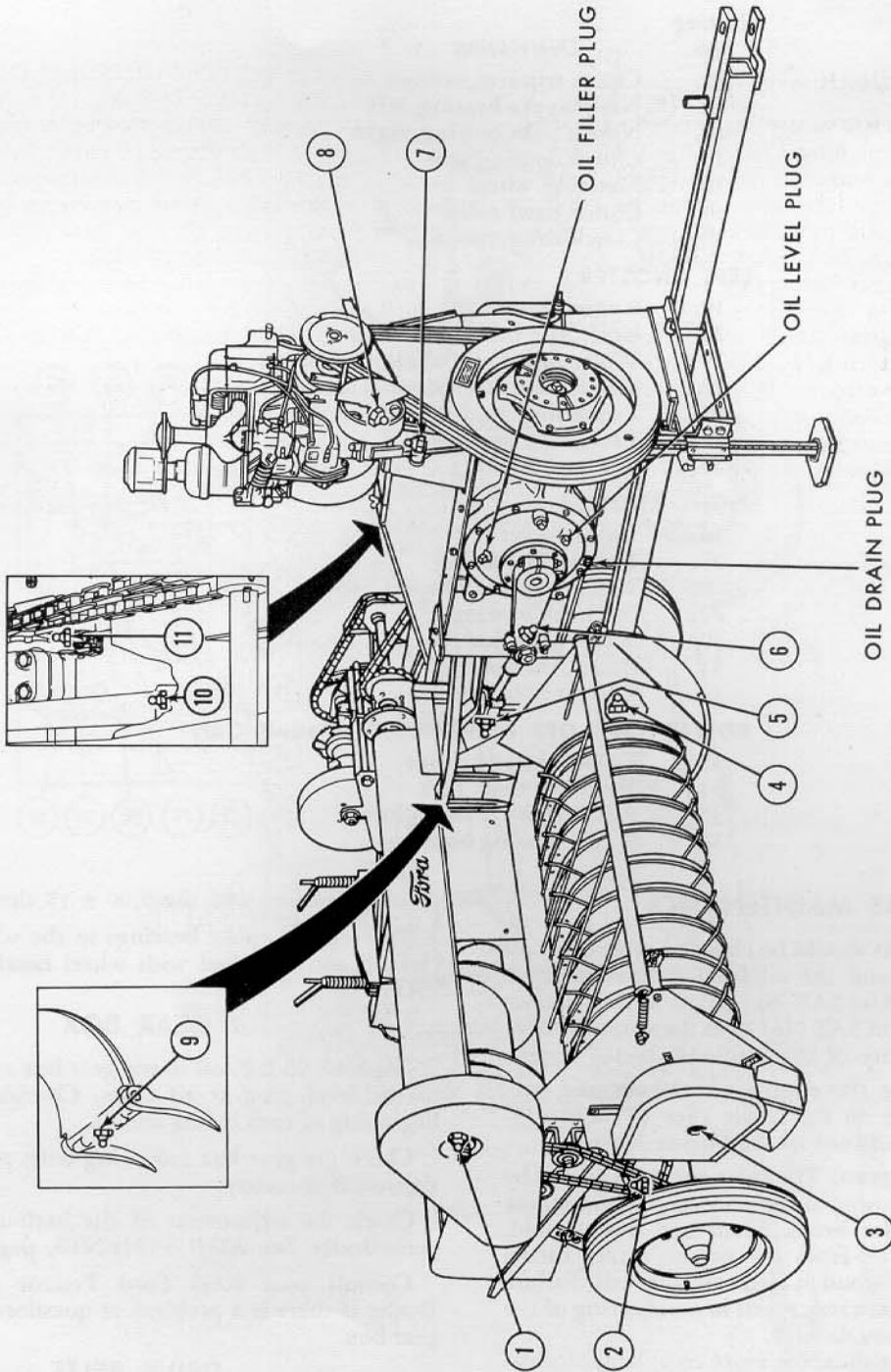
On P.T.O. Driven Hay Balers, always keep the P.T.O. drive shaft and telescoping shield thoroughly lubricated to prevent binding. The P.T.O. bearing housing (see 36, Lubrication Chart "B") should be cleaned and repacked with grease once yearly.

KEY TO LUBRICATION CHART "A"

<i>Fitting No.</i>	<i>Description</i>
1.	Pick-up drive ratchet type, non-reversing clutch
2.	Pick-up reel drive sprocket
3.	Pick-up reel shaft bearing, right
4.	Pick-up reel shaft bearing, left
5.	Feed fork universal joint, rear
6.	Feed fork universal joint, front
7.	Idler pulley lever pivot (engine model only)
8.	Idler pulley, main drive (engine model only)
9.	Feed fork bearing
10.	Plunger connecting rod, wrist pin
11.	Main drive chain idler

LUBRICATION CHART "A"

FORD SERIES "250" HAY BALER



PREPARED BY
**TRACTOR AND IMPLEMENT
 DIVISION**
 SERVICE DEPARTMENT

MAINTENANCE

KEY TO LUBRICATION CHART "B"

<i>Fitting No.</i>	<i>Description</i>
12.	Clutch trip arm, bottom
13.	Needle yoke bearing, left
14.	Needle yoke bearing, right
15.	Clutch housing arm
16.	Metering wheel
17.	Clutch pawl roller
18.	Clutch drive sprocket

LEFT KNOTTER

19.	Knotter housing
20.	Knife arm bearing
21.	Worm gear shaft bearing, upper
22.	Worm gear shaft bearing, lower
23.	Twine finger
24.	Twine disc bearing
25.	Bill hook bearing

RIGHT KNOTTER

26.	Twine finger
27.	Twine disc bearing
28.	Worm gear shaft bearing, lower
29.	Bill hook bearing
30.	Worm gear shaft bearing, upper
31.	Knife arm bearing
32.	Knotter housing

POWER TAKE-OFF DRIVE (P.T.O. Models Only)

33.	Twin universal, front
34.	Twin universal, rear
35.	P.T.O. drive chain tightener
36.	P.T.O. bearing housing

ENGINE MAINTENANCE

Oil Changes: The oil should be changed after every 50 hours of operation and the oil level checked every 8 hours of operation. Use SAE No. 30 oil in the summer (120°F. to 40°F.) and SAE No. 20 in the winter (40°F. to 5°F.). The capacity of the crankcase is 3½ quarts.

Air Cleaner: Service the engine air cleaner and pre-cleaner as instructed on the labels (See (1) and (2), (Figure 4) and as outlined in the Engine Manual.

Rotary Air Intake Screen: The baler engine is cooled by air which must be allowed to circulate around the engine cylinders and cylinder heads. Chaff and dust should, therefore, be removed from the engine rotary intake screen and cylinder shroud at frequent intervals. Failure to keep the engine clean may result in overheating of the engine with consequent damage.

Study the engine manual for more complete information on the operation, care and maintenance of the Wisconsin TFD Engine (Issue MM-249-B).

TIRES AND WHEELS

Check the tire pressure at frequent intervals during operation of the baler. Inflate the 6:40 x 15 tire to 36

pounds pressure and the 5:00 x 15 tire to 30 pounds.

The tapered roller bearings in the wheels should be cleaned and repacked with wheel bearing grease once every year.

GEAR BOX

Use SAE 90 E.P. oil in the gear box and keep it filled to the level plug at all times. Change the oil at the beginning of each baling season.

Check the gear box mounting bolts periodically, and tighten, if necessary.

Check the adjustment of the back-up support stud periodically. See ADJUSTMENTS, page 9.

Consult your local Ford Tractor and Implement Dealer if there is a problem or question concerning the gear box.

DRIVE BELTS

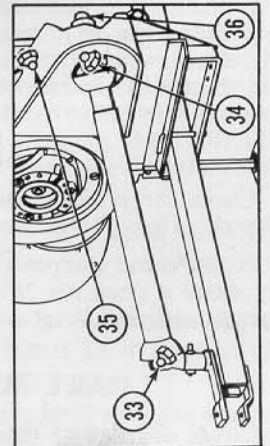
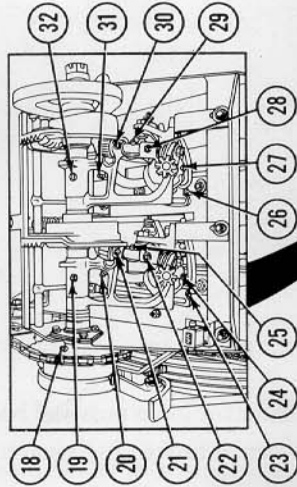
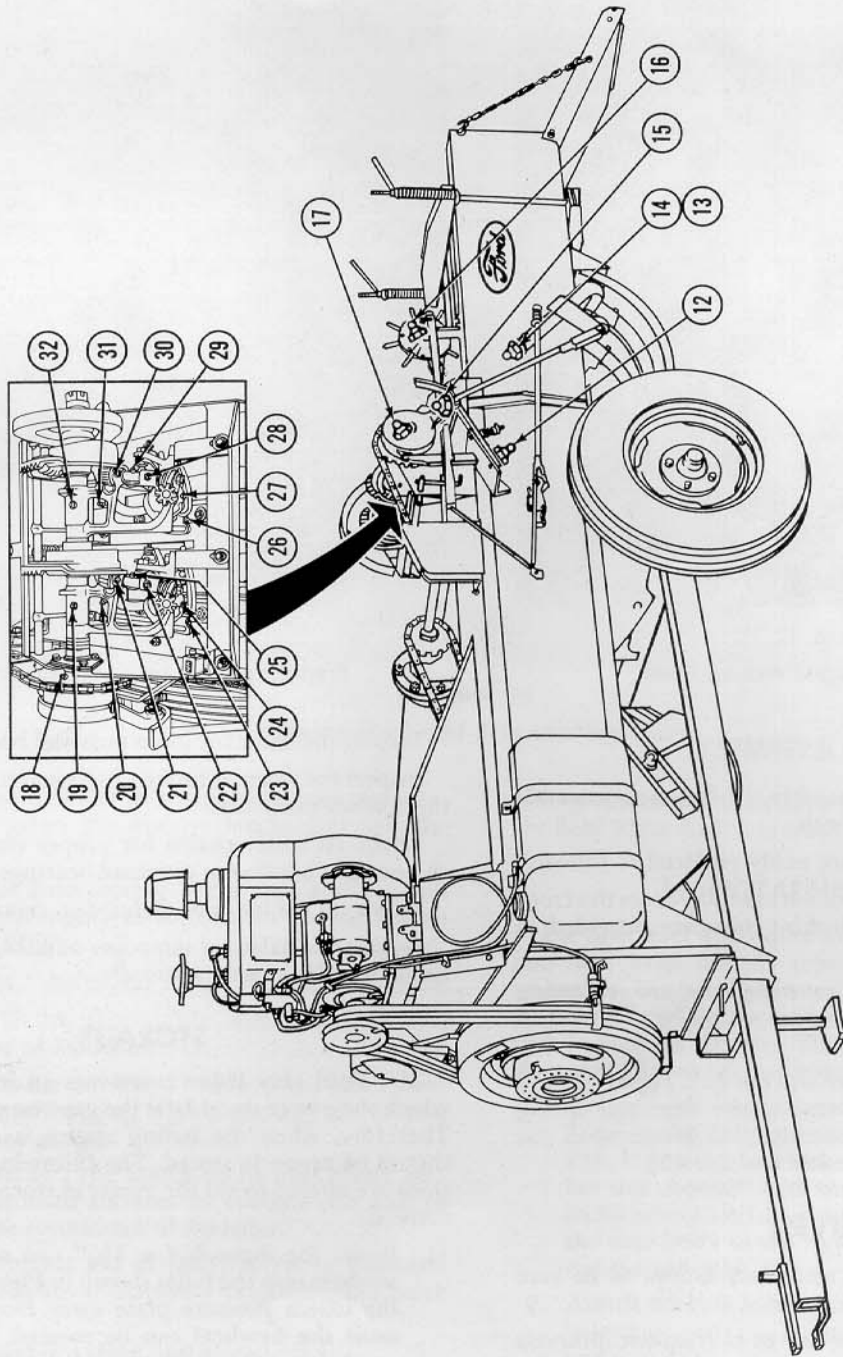
Do not use belt dressing on the V-belts at any time.

If a belt becomes worn, replace all the belts. This will assure that belts are the same length.

Keep the belt guide properly adjusted as directed in the section on ADJUSTMENTS.

LUBRICATION CHART "B"

FORD SERIES "250" HAY BALER



PREPARED BY
**TRACTOR AND IMPLEMENT
DIVISION**
SERVICE DEPARTMENT

MAINTENANCE

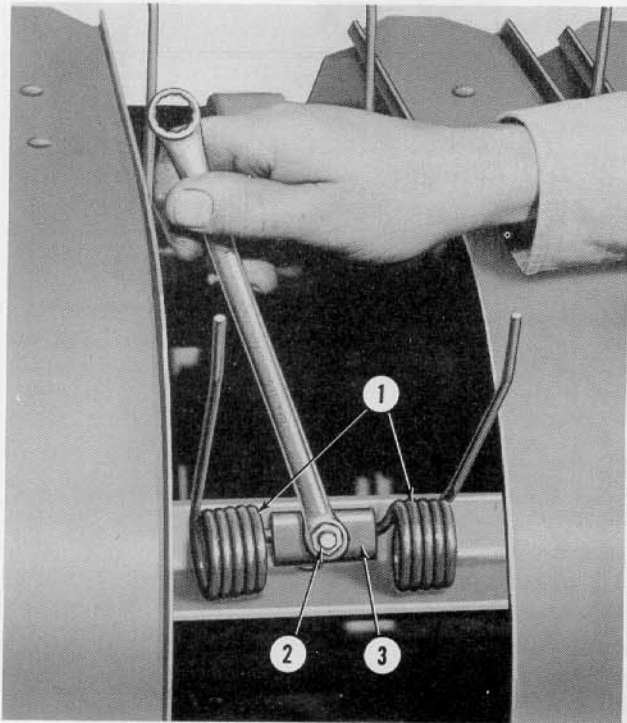


Figure 32
Replacing Damaged Pick-up Teeth

PICK-UP ASSEMBLY

Inspect the pick-up assembly at frequent intervals for bent or broken spring teeth.

Damaged spring teeth are easily replaced as follows:

1. Remove the hay hold-down assembly from the front of the pick-up. Self-locking pins are provided to facilitate removal.
2. Remove the reel band covering the damaged spring tooth by removing the four round head screws in the band.
3. Remove the lockwasher and nut (2), Figure 32, and the clamp (3), then replace the damaged spring tooth with a new assembly (1). Secure with the clamp (3) and lockwasher and nut (2).

KNIVES

Check the plunger and stationary knives to be sure that there is $\frac{1}{16}$ " clearance.

Remove and sharpen the knives at frequent intervals to obtain a clean cut. When grinding, be sure to maintain the original bevel on the knives.

DAILY MAINTENANCE

Clean the baler thoroughly. Particular attention should be given the knottor mechanism.

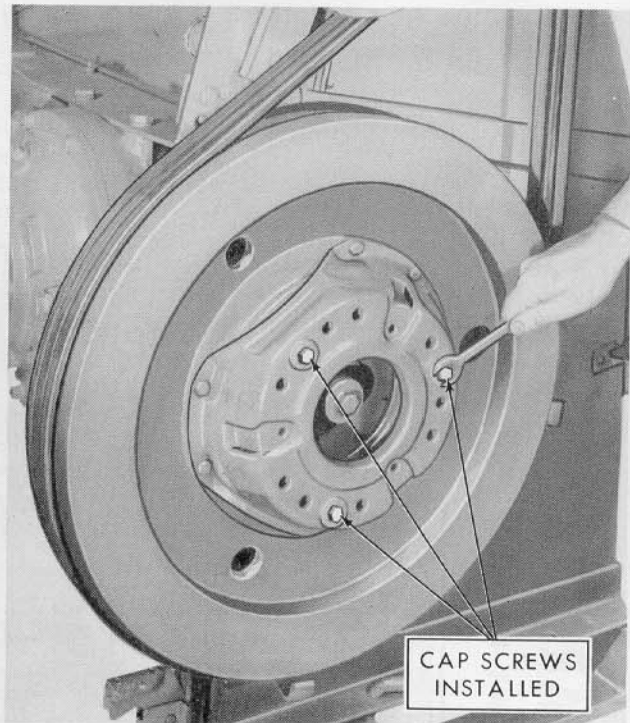


Figure 33
Preparing Flywheel Clutch for Storage

Inspect the baler for loose nuts and bolts.

Inspect for worn or broken parts and promptly replace them when necessary.

Check all roller chains for proper tension. Keep the chains tight but do not overload bearings.

Lubricate the baler as directed in this manual.

Inspect the baler for improper adjustments. Make any necessary adjustments promptly.

STORAGE

The Ford Hay Baler represents an investment from which the owner should get the greatest possible benefit. Therefore, when the baling season is over, the baler should be properly stored. The following recommendations are offered to aid the owner in storing the hay baler correctly.

1. Insert the three $\frac{3}{8}$ " x $1\frac{3}{4}$ " cap screws with flat washers into the holes shown in Figure 33 and draw the clutch pressure plate away from the flywheel until the flywheel can be rotated, by hand, with some drag. This will prevent the clutch discs from adhering to the flywheel during storage. Refer to page 36, FLYWHEEL AND CLUTCH ASSEMBLY, for information when the baler is removed from storage.
2. Loosen the tension on the bale tension bars and remove all hay from the chamber.

ATTACHMENTS

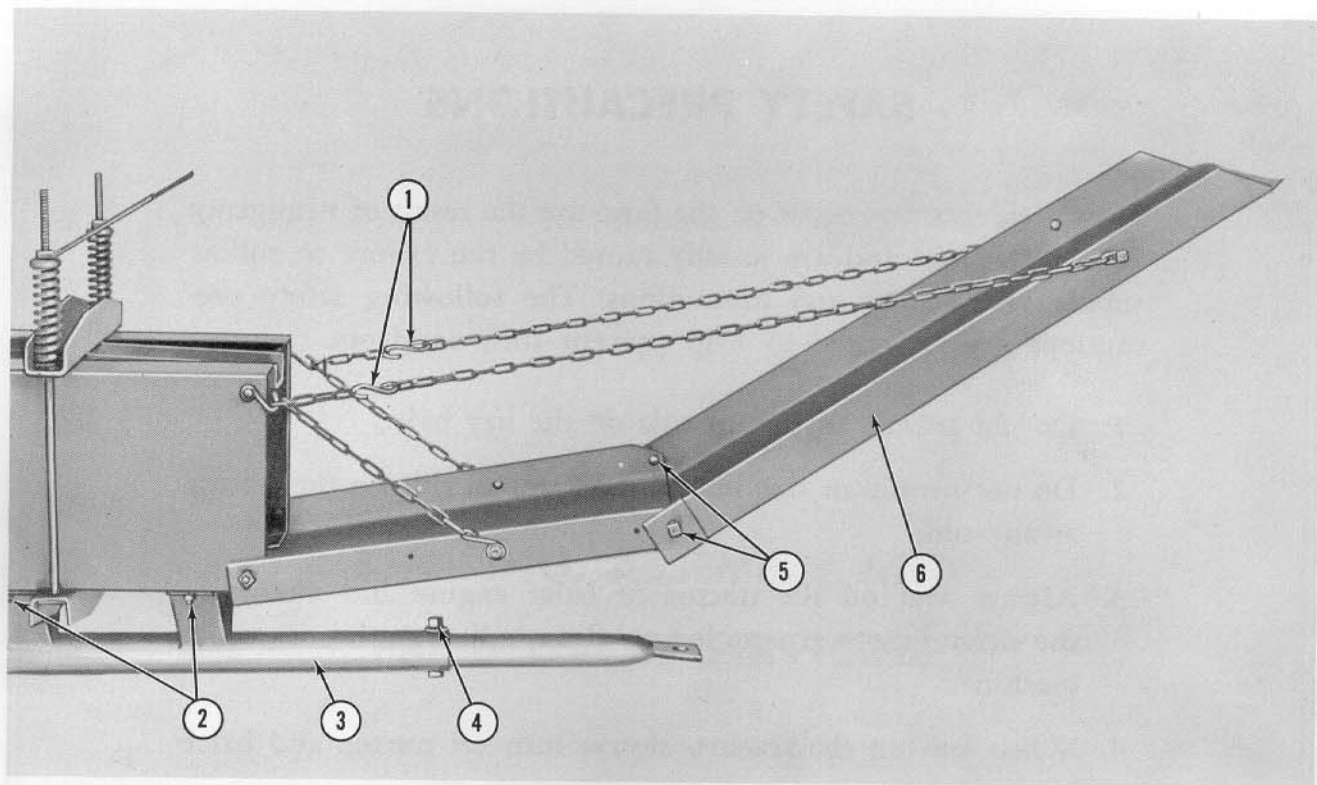


Figure 34

Wagon Hitch and Bale Loading Chute

3. Clean the entire baler thoroughly. Special attention should be given the knotter mechanism and the engine.
4. Operate the baler empty for a few minutes and lubricate thoroughly as directed in the section on LUBRICATION.
5. Remove the V-belts and store in a dry, cool place.
6. Clean the chains thoroughly with a solvent and apply a coat of motor oil.
7. Coat the knotter parts and inside of the bale chamber and auger housing with a good grade of rust preventive or grease.
8. Use Ford Spray Type Touch-up Enamel where necessary on painted surfaces to prevent rust and to maintain the appearance of the baler.
9. Make a complete list of badly worn or damaged parts and replace them while preparing the baler for storage.
10. Store the baler in a clean, dry place.
11. Block the baler up to take the weight off the tires. Do not deflate the tires.
12. Refer to the engine manual for instructions on engine storage.

If the above procedure is followed when storing the Ford Hay Baler, it will be in good condition for the next

baling season and little time will be lost in getting into the field when the hay is ready.

ATTACHMENTS

For operators who desire to hitch a wagon to the baler and load bales directly from the bale chute onto the wagon, a Wagon Hitch and Bale Loading Chute are available, at extra cost, from your local Ford Tractor and Implement Dealer. These attachments, which are shown in Figure 34, are installed as follows:

1. Remove the round head screw holding the axle brace to the bale chamber. Attach the wagon hitch (3), Figure 34, to the underside of the bale chamber side channels with the three round head screws, lockwashers and hex nuts (see 2), then reattach the axle brace to the right front hitch support and tighten securely.
2. Attach the bale loading chute (6), Figure 34, to the bale chute with two round head screws, lockwashers and nuts (5).
3. Raise the bale loading chute to the desired height and attach the hooks (1), Figure 34, to the ends of the bale chute chains as shown.
4. Adjust the hitch to the proper length for the wagon tongue by removing the bolt, lockwasher and nut (4). Reinstall the bolt and tighten securely.

SAFETY PRECAUTIONS

Most accidents that occur on the farm are the result of negligence and carelessness and are usually caused by the failure to follow simple safety rules and precautions. The following safety precautions are suggested to help prevent such accidents.

1. Do not permit anyone to ride on the hay baler.
2. Do not permit anyone but the operator to ride on the tractor at any time.
3. Always shut off the tractor or baler engine and disengage the drive before attempting to clean, adjust or lubricate the machine.
4. When leaving the tractor, always turn off tractor and baler engine.
5. Avoid setting the slip clutches so tight that they will fail to function when obstructions are encountered.
6. Keep all nuts, bolts, screws and connections tight.
7. Be sure that all safety shields are in place before operating the hay baler.
8. Inspect the bale chamber before operating to be sure there are no obstructions.
9. Keep the tractor and baler engine clean to avoid the possibility of fire.
10. Keep the tractor keys where they are not available to children.

SHIPPING

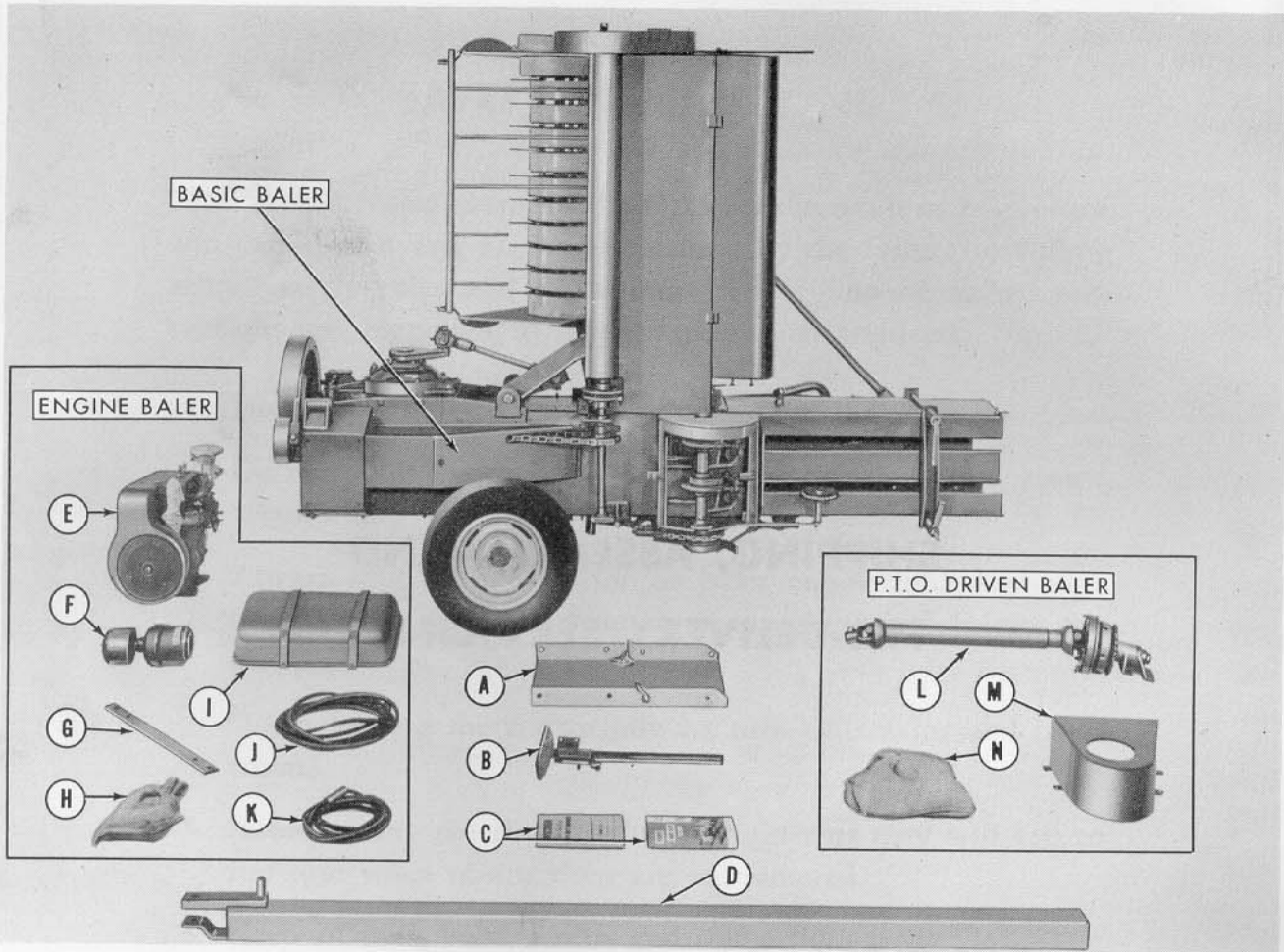


Figure 35
Ford Hay Baler Bundle Breakdown

SHIPPING INFORMATION

The Ford Hay Baler is shipped as Bundle No. 14-71 (engine with starter), Bundle No. 14-76 (engine without starter), or Bundle No. 14-80 (P.T.O. driven).

The major units of the hay baler are assembled when the machine is shipped from the factory. Only those parts which might be damaged by the position of the baler in shipment have been removed.

The following list and Figure 35 shows the basic baler and parts common to all balers (A through D), parts common only to engine driven balers (E through K) and parts common only to P.T.O. driven balers (L through N). Check the shipment against the list and Figure 35 to be sure all parts are received.

Item	Description
Basic Baler	Baler with wheels attached and the parts listed below in the bale chamber and auger housing.
A	Bale chute with chains attached
B	Jack assembly

Item	Description
C	Owner's Manuals
D	Tongue Assembly

PARTS INCLUDED ONLY WITH ENGINE BALERS

E	Engine with starter (Model 14-71 only)
E	Engine less starter (Model 14-76 only)
F	Air cleaner assembly
G	Idler pulley lever
H	Bag of miscellaneous hardware
I	Gasoline tank and brackets
J	Three V-belts
K	Starter cables (Model 14-71 only)

PARTS INCLUDED ONLY WITH P.T.O. BALERS

L	Power take-off drive assembly
M	Power take-off clutch and sprocket shield
N	Bag containing drive chain, chain tightener and other miscellaneous hardware

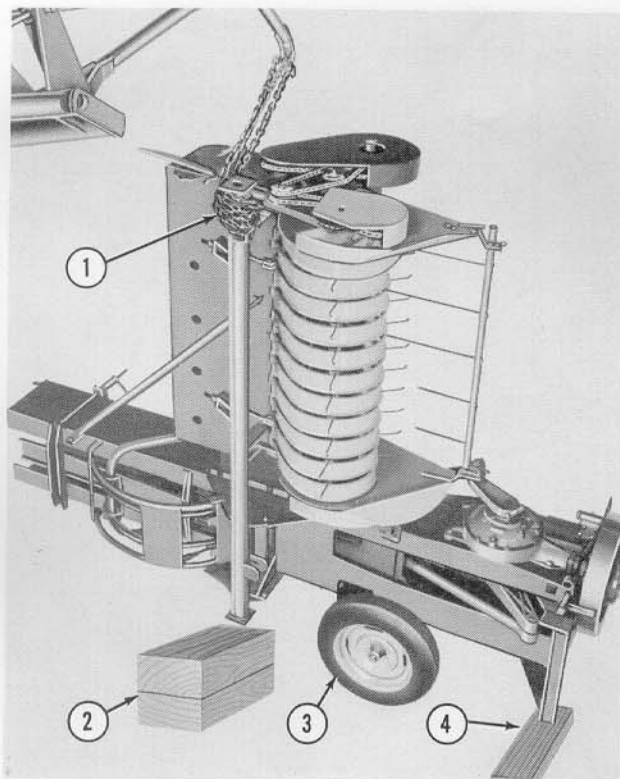


Figure 36

Lowering Baler from Shipping Position

RESPONSIBILITY OF THE DEALER

The Ford Tractor and Implement Dealer is responsible for the proper assembly and pre-delivery servicing of the Ford Hay Baler.

The machine should be completely assembled, adjusted, serviced, and given the recommended "break-in," as outlined in this manual, before delivery to the purchaser.

The dealer will show the purchaser how to operate the baler, make necessary adjustments and will answer questions as to its operation.

ASSEMBLY PROCEDURE

NOTE: The terms left and right, as used in this manual are determined from a position facing the direction of baler travel.

For obvious safety reasons, the basic baler in its upright position on the shipping axle should not be moved or transported more than is absolutely necessary. It is recommended that the baler be lowered to normal operating position with the wheels attached. The following information outlines the suggested procedure for lowering a basic baler from its shipping position.

LOWERING THE BALER

1. Using a tractor loader equipped with a front end crane or similar hoist, secure a chain around the

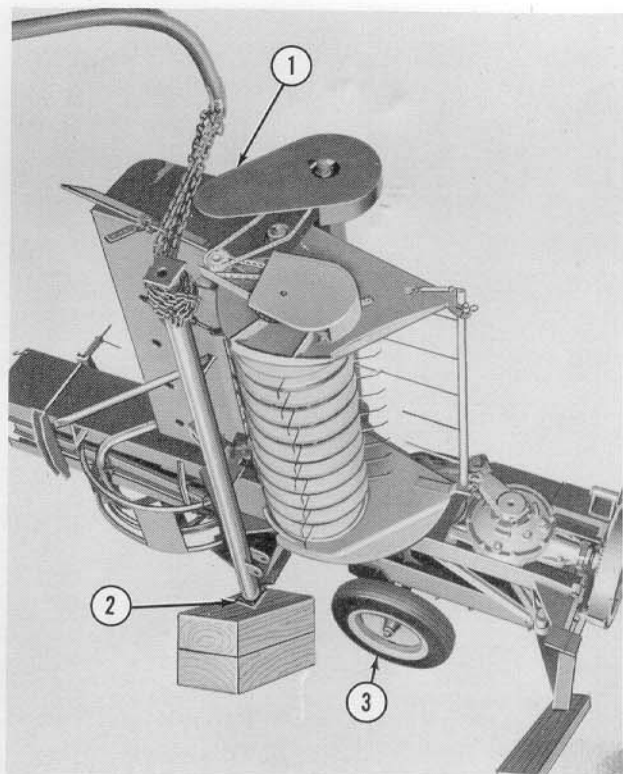


Figure 37

Baler Axle Supported on Blocks

baler axle and under the auger support bracket as shown at (1), Figure 36.

NOTE: It is suggested that the tractor-loader operator approach the baler from the right side and slightly to the rear as shown in Figure 36.

2. If the baler is on concrete where there is danger of sliding, place a board under the front end as shown at (4), Figure 36.
3. Position suitable blocking under the baler axle as shown at (2), Figure 36, so that the end of the axle will be supported on the blocks as the baler is lowered.
4. Slowly and carefully back up the tractor, pulling the baler over on the wheel as shown at (3), Figure 36.
5. Continue to back up the tractor slowly and lower the loader crane slightly, taking care not to damage the chain shield (1), Figure 37. Lower the baler until the end of the axle is supported on the wood blocks as shown at (2). At this point, the weight of the baler will be off the wheel (3).

CAUTION: Proceed slowly and carefully at all times.

ASSEMBLY

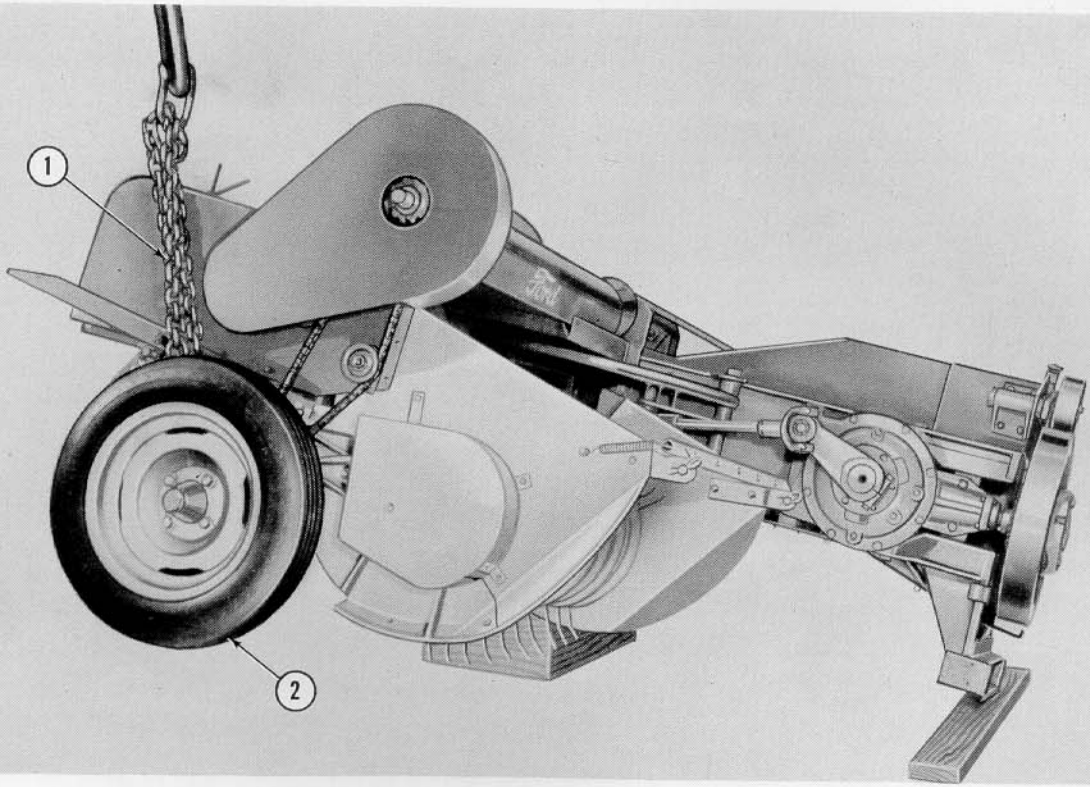


Figure 38

Baler Right Wheel Installed

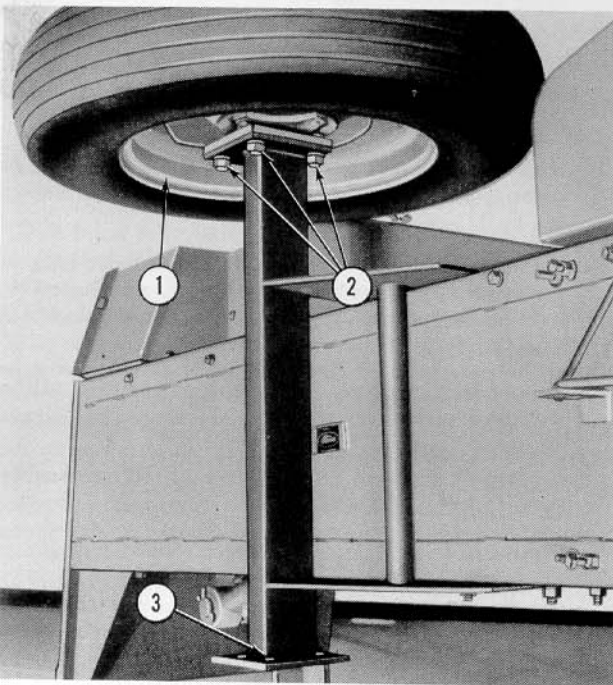


Figure 39

Shipping Axle

6. Lower the loader crane until the baler is positioned as shown in Figure 38. Working from the left side of the baler, remove the 5:00 x 15 baler wheel and mounting bracket (1), Figure 39, from the upper end of the shipping axle by removing the four $\frac{1}{2}$ " x $1\frac{1}{4}$ " hex head bolts, nuts and lockwashers (see 2).
7. Attach the small wheel (2), Figure 38 and mounting bracket to the right end of the baler axle as shown, then lower the baler to the ground and remove the chain (1).
8. Place a jack under the left side of the baler and raise it until the blocks (2), Figure 36, can be removed from under the axle.
9. Remove the 6:40 x 15 baler wheel and mounting bracket from the lower end of the shipping axle (3), Figure 39, and install it on the left end of the baler axle (2), Figure 40, with four $\frac{1}{2}$ " x $1\frac{1}{4}$ " hex head bolts, lockwashers and nuts. (1). Tighten the nuts and bolts securely.
10. Remove the shipping axle from the baler.

INSTALLING THE TONGUE AND JACK ASSEMBLY

1. Using a floor jack or other suitable hoist, raise the front of the baler. Position the tongue assembly

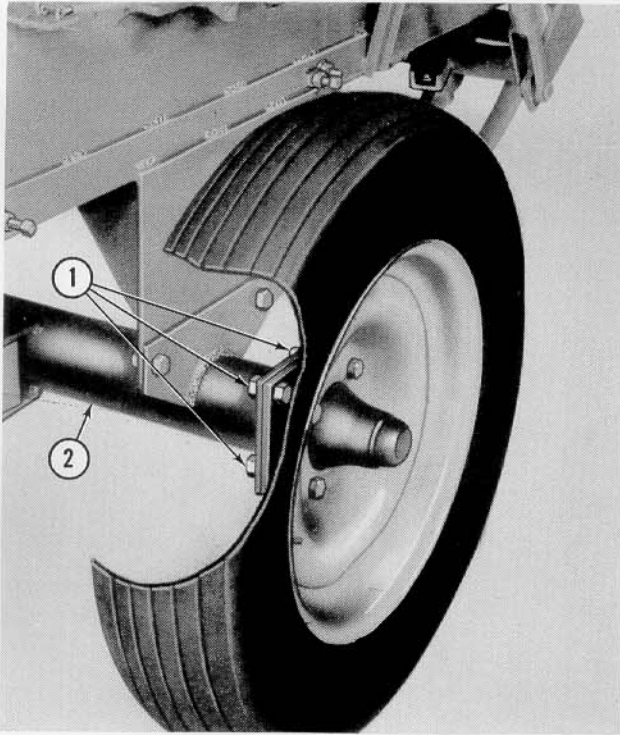


Figure 40
Baler Left Wheel Installed

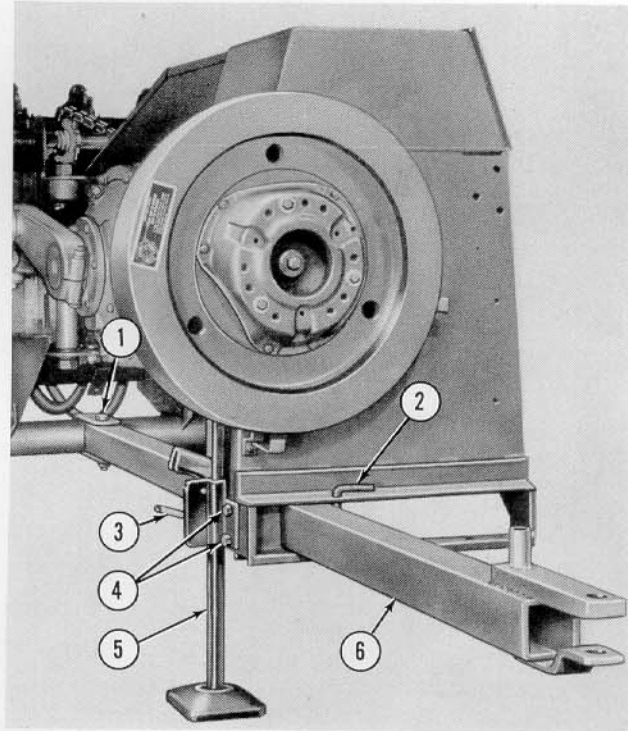


Figure 41
Tongue and Jack Installed

(6), Figure 41, through the tongue support bracket as shown and attach it to the axle with the $\frac{5}{8}$ " x $4\frac{1}{4}$ " hex head bolt and castellated nut (1). Secure the nut with a cotter pin.

2. Insert the pin (2), Figure 41, through the holes in the tongue support bracket to secure the tongue. Use the extreme left position for field operation and the extreme right position (as shown) for transport purposes.
3. Attach the jack stand (5), Figure 41, and ratchet housing to the baler with the four $\frac{3}{8}$ " x $1\frac{1}{4}$ " hex head bolts and lockwashers (4). Set the ratchet lever (3) as directed on the jack to raise or lower the baler.

NOTE: For the remaining assembly of Model 14-80 P.T.O. Hay Balers, refer to *INSTALLING THE P.T.O. DRIVE ASSEMBLY*, page 35.

INSTALLING THE ENGINE AND GAS TANK (ENGINE MODELS)

1. Using a suitable hoist and sling as shown at (1), Figure 42, raise the baler engine and position it on the baler engine mount (3). Secure the engine to the mount with the four $\frac{1}{2}$ " x 2" hex head bolts (5), Figure 43, lockwashers and nuts and with the belt adjusting spacers (6) stored under the bolts as shown. Tighten the bolts securely.

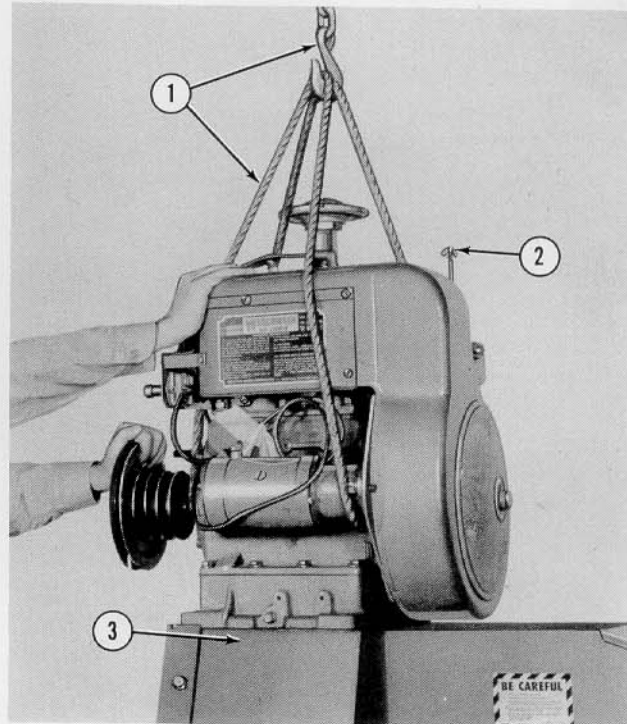


Figure 42
Mounting the Engine

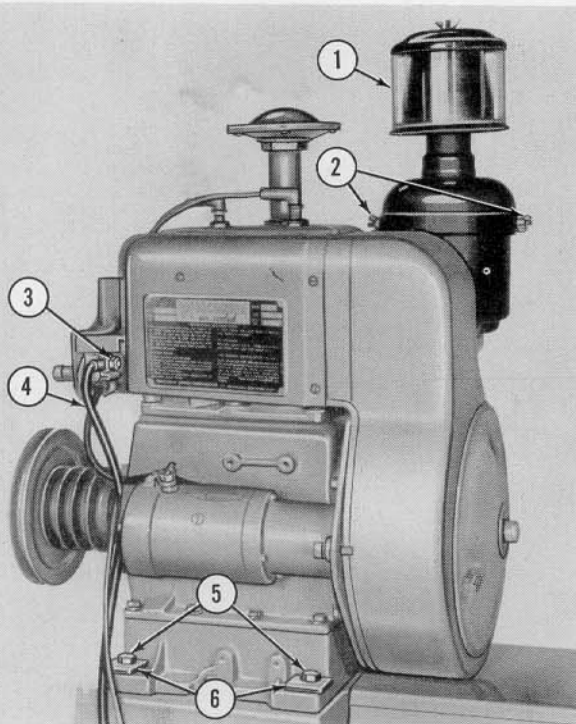


Figure 43
Engine and Air Cleaner Installed

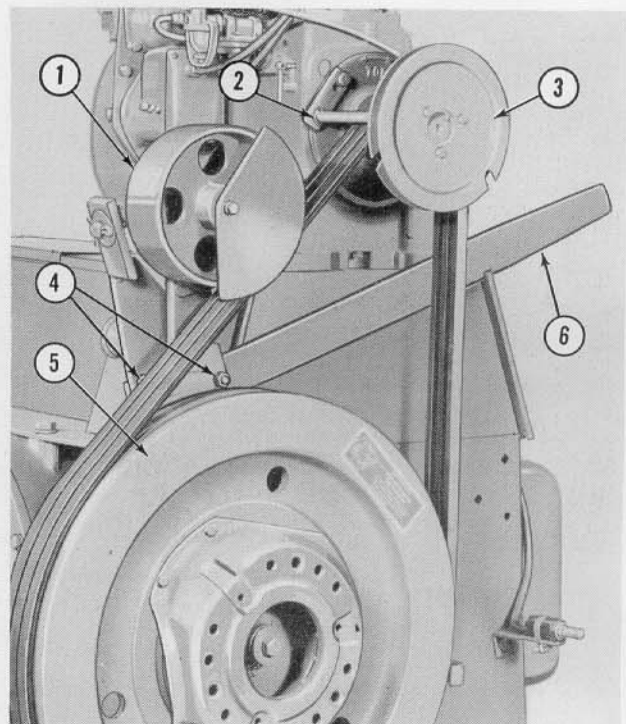


Figure 45
Idler Lever and Drive Belt Installed

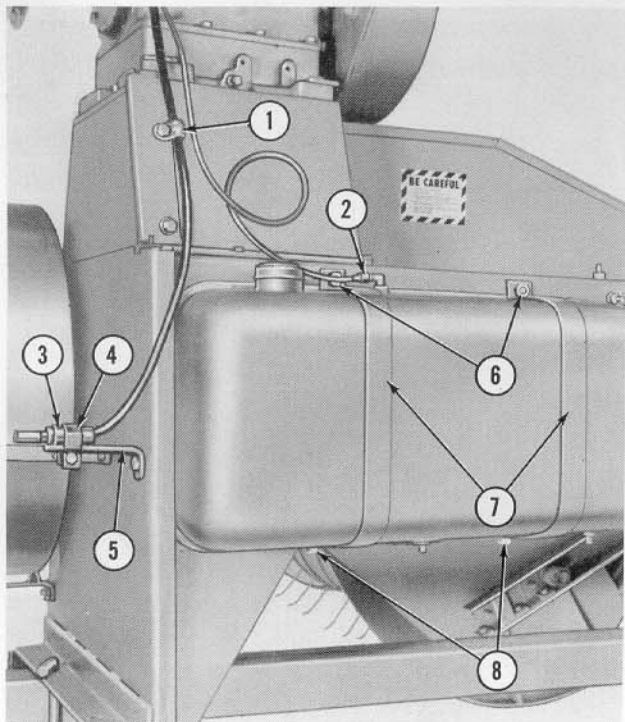


Figure 44
Starter Cable and Gas Tank Installed

2. Loosen the wing nuts (2), Figure 43, and remove the pre-cleaner (1) from the air cleaner assembly. Install the lower part of the air cleaner on the engine (with the gasket in place) and secure with the wing nut (2), Figure 42. Reinstall the pre-cleaner and tighten the wing nuts (2), Figure 43, securely.
3. Attach the starter cable (4), Figure 43, to the starter switch as shown at (3), then secure it to the engine mount with the clip (1), Figure 44, and the bolt in the idler lever latch. Attach the cable connector bracket (5), Figure 44, to the baler with a $\frac{3}{8}$ " x 1" hex head bolt, lockwasher and nut. Secure the connector (3) to the bracket (5) with the clamp (4).
4. Attach the gas tank to the side of the baler with the two straps (7), Figure 44, and secure with four lockwashers and hex nuts (6) and (8). Attach the fuel line to the fitting on the top of the tank as shown at (2).

INSTALLING IDLER LEVER AND DRIVE BELTS (ENGINE MODELS)

1. Attach the idler lever (6), Figure 45, to the idler arm with two $\frac{3}{8}$ " x $\frac{11}{8}$ " carriage bolts, lockwashers and nuts (4).
2. Install the three V-belts around the engine pulley (3), Figure 45, under the belt guide (2), under the idler pulley (1) and around the flywheel (5) as

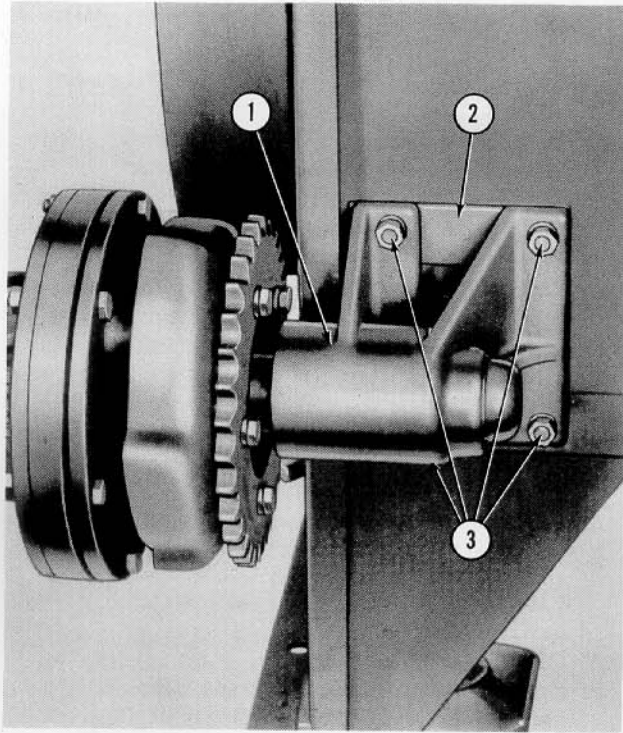


Figure 46

P.T.O. Shaft Housing Attached

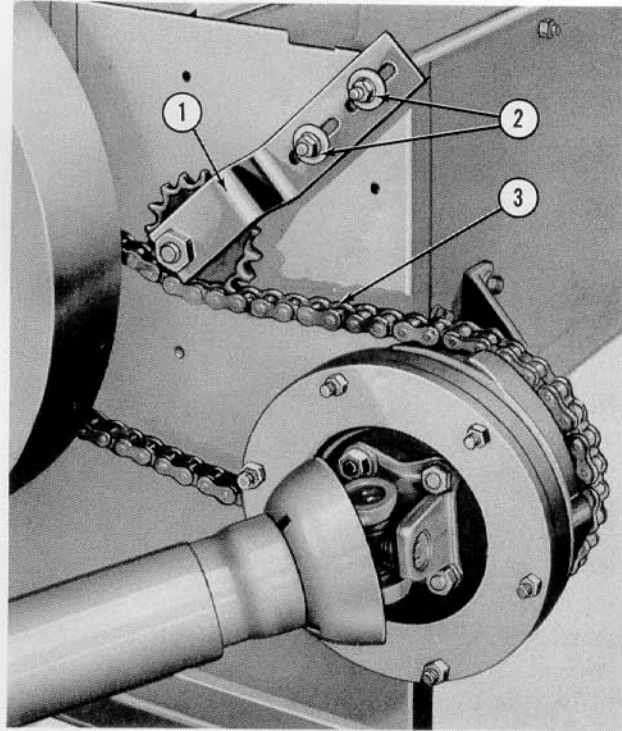


Figure 47

P.T.O. Drive Chain and Chain Tightener Installed

- Engage the idler pulley and check to be sure that the V-belts clear the belt guide (2), Figure 45 by approximately $\frac{1}{8}$ ". If necessary, adjust the belt guide until the belts just clear it.

CAUTION: Keep the idler pulley in the disengaged position unless the baler is to be operated.

INSTALLING THE P.T.O. DRIVE ASSEMBLY (P.T.O. MODELS)

- Attach the power shaft bearing housing (1), Figure 46, to the baler with the four $\frac{3}{8}$ " x $1\frac{3}{4}$ " hex head bolts, lockwashers and nuts (3). Install the spacer (2) between the bearing housing and the baler and check the alignment of the housing on the baler. If necessary, add shims between the bearing housing (1) and the spacer (2) until the housing is properly aligned without binding.
- Install the drive chain (3), Figure 47, around the clutch drive sprocket and the flywheel driven sprocket as shown.
- Attach the chain tightener (1), Figure 47, to the baler with the two $\frac{3}{8}$ " x $1\frac{1}{8}$ " step bolts, flat washers, lockwashers and hex nuts (2). Adjust the tightener for proper chain tension as outlined under ADJUSTMENTS.
- Slide the P.T.O. clutch and drive chain shield (2), Figure 48, over the power shaft (3) and attach it to the baler with four $\frac{3}{8}$ " x $\frac{3}{4}$ " hex head bolts, lockwashers and nuts. See (1).

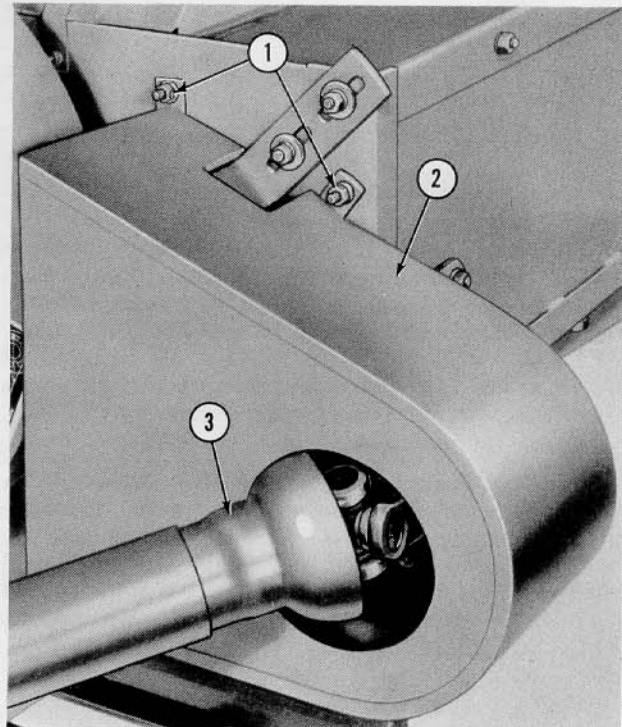


Figure 48

P.T.O. Drive Chain Shield Installed

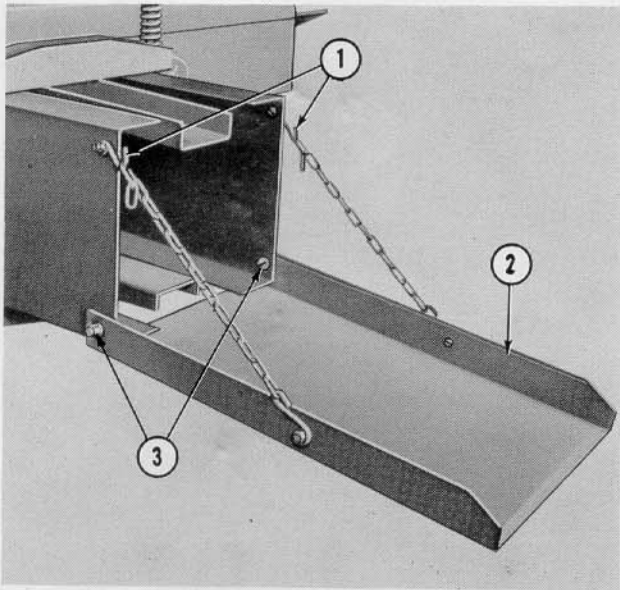


Figure 49
Bale Chute Attached

ATTACHING THE BALE CHUTE (ALL BALERS)

1. On both engine and P.T.O. driven balers, attach the bale chute (2), Figure 49, to the rear of the bale chamber with the two $\frac{1}{2}$ " x $1\frac{1}{4}$ " round head screws, bushings, flat washers, lockwashers and nuts (3) located on the baler.
2. Set the bale chute at the desired angle and secure it by attaching the chains to the hooks (1), Figure 49, on the bale chamber.

FLYWHEEL CLUTCH ASSEMBLY

Since balers may be exposed to weather during shipment, between crops and during storage, the pressure plate in the flywheel clutch assembly is drawn away from the cast iron surface of the flywheel to prevent adhering due to moisture and rust. **THE BALER WILL NOT OPERATE UNTIL THE PLATE IS RELEASED** Before releasing the pressure plate, burnish the clutch by rotating the flywheel with the engine.

CAUTION: Do not burn the clutch.

To release the pressure plate, remove the three $\frac{3}{8}$ " x $1\frac{3}{4}$ " hex head cap screws and flat washers from the holes shown in Figure 33. The cap screws and flat washers should be placed in the tool compartment of the twine box for use by the owner, and, at the time of delivery, owners should be referred to the section on STORAGE for information on clutch storage.

SERVICING PROCEDURE

It is important that the new Ford Baler be properly serviced before it is taken into the field. After it has been completely assembled, the baler should be lubri-

cated, adjusted and operated according to the following procedure.

1. Lubricate the baler as directed in the section on LUBRICATION.
2. Check the baler carefully to be sure that it is properly adjusted as outlined in the section on ADJUSTMENTS, page 8.
3. Remove the protective coating from the knotter bill hooks and twine discs.
4. Check all belts and chains for proper tension and alignment.
5. Check the air pressure in the tires. Inflate the 6:40 x 15 tire to 36 pounds pressure and the 5:00 x 15 tire to 30 pounds.
6. Trip the knotter mechanism by releasing the trip arm on the left side of the baler. Make sure that the knotter clutch operates freely.
7. Turn the flywheel by hand in a counterclockwise direction several times to be sure that the needles and other parts move freely.

CAUTION: Do not place hands between flywheel and drive belts.

8. On engine driven balers, check the oil level in the engine crankcase, the oil bath in the air cleaner, and the oil level in the gear box. Fill the fuel tank with a good grade of REGULAR gasoline and pump the primer lever as instructed under OPERATION.
9. On engine balers, disengage the drive belt idler. Start the engine and operate it at a moderate speed.
10. On P.T.O. driven balers, disengage the tractor P.T.O. and start the tractor engine.
CAUTION: To avoid accidents, be sure that the baler is free and clear and that no one is in a position to be injured when the machine is started.
11. Start engine balers by engaging the idler pulley slowly. On P.T.O. balers, depress the clutch and engage the tractor P.T.O. Operate the baler for about 15 minutes at a moderate speed.
12. Inspect the chains for tightness and belts for slippage.
13. Trip the knotter mechanism 25 to 30 times by releasing the trip arm.
14. Disengage the main drive idler pulley or power shaft and shut off the engine.
15. Check all bearings for signs of overheating. Lubricate if necessary.
16. Lubricate all grease fittings.
17. Start the baler again and operate for about 30 minutes.
18. Check the R.P.M. of the crankshaft. Operate the baler at 68 strokes per minute for a short time.
19. Stop the baler, shut off the engine and check the bearings again for overheating.
NOTE: Check all bearings hourly for overheating during the first ten hours of operation.
20. Check all nuts and bolts for tightness.

PRE-DELIVERY

Series 250 Ford Hay Baler

PRE-DELIVERY CHECK LIST

Owner's Name _____

Address _____

Hay Baler Model _____ Serial No. _____

AFTER IMPLEMENT ASSEMBLY

- | | |
|---|---|
| <input type="checkbox"/> Tires checked for proper inflation. | <input type="checkbox"/> Knotters checked for proper operation and tying. |
| <input type="checkbox"/> Machine lubricated thoroughly as outlined in lubrication charts. | <input type="checkbox"/> Pick-up properly adjusted. |
| <input type="checkbox"/> Oil in gear box at correct level. | <input type="checkbox"/> All shields in place. |
| <input type="checkbox"/> All bolts checked for tightness. | <input type="checkbox"/> Engine serviced as outlined in the engine instruction manual. |
| <input type="checkbox"/> All chains checked for proper deflection. | <input type="checkbox"/> Implement run-in as outlined in servicing procedure. |
| <input type="checkbox"/> Drive belts checked for proper tension. | <input type="checkbox"/> All bearings checked for overheating. |
| <input type="checkbox"/> Slip clutches operating freely. | <input type="checkbox"/> Implement checked for loose parts and proper deflection of belts and chains after run-in period. |
| <input type="checkbox"/> Knives checked for proper clearance. | <input type="checkbox"/> Implement cleaned and touch-up enamel used when needed. |
| <input type="checkbox"/> Plunger checked for free operation. | |
| <input type="checkbox"/> Needles timed and checked for proper height and clearance. | |

AT TIME OF DELIVERY

- Operation and adjustment of implement explained to owner as outlined in this manual.
- All lubrication fittings pointed out to owner.
- Safety rules and precautions explained to owner.

DATE

DEALER SIGNATURE